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MONTANA OUTDOORS

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MONTANA OUTDOORS

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THE JOY OF BACKPACKING

by John Fraley

Why go backpacking?

When you shoulder a pack and hit the trail, you become self-sufficient and move freely through an unspoiled landscape. Problems seem less important, and there are no deadlines to meet. What's more, backpacking is a sport you can enjoy with your family and friends. In the past, only a few hardy souls journeyed beyond the road's end. Now, modern equipment and maintained trails have opened the backcountry to everyone.

But even though access and use have increased, there are still plenty of areas where you can "rough it" by traveling cross-country or on primitive trails. Whether you enjoy camping with friends along a lakeshore two miles from the trail head or hiking for three days without seeing a soul, you'll find what you're looking for by spending a few nights in Montana's backcountry.

What's wrong with one-day trips? Day hikes can take you into fairly remote areas, but you won't reach your destination until midday, and you'll have to leave by late afternoon. Indeed, the only way to really savor a backcountry experience—the only way to make an extensive trip into the wilderness—is to hoist a pack and leave civilization behind for a few days.

Deciding Where to Go

Before you make detailed plans and preparations for your backpack trip, you must first decide where you'd like to go. This decision may not be as simple as it sounds. There are many considerations, including length of stay, length and steepness of the trail, water availability and quality, campsite elevation, possible side trips, and available opportunities for enjoying wildlife, fishing, or photography. More than anything else, be sure the rigors of the trip are not beyond the capabilities of you and your companions.

One of the best ways to choose a destination is to talk to someone who has taken some trips that he or she has enjoyed. A person who has been there can fill you in on trail information, location of campsites, etc. You can get timely and accurate information about trails and campsites by calling the nearest district office of the U.S. Forest Service (listed in the telephone book under "U.S. Government, Department of Agriculture") or National Park Service (listed under "U.S. Government, Department of Interior"). Be sure to check on campfire regulations and other restrictions pertaining to the area you plan to visit.

Where should you go? The opportunities are almost limitless. There are more than 15,000 miles of hiking trails in Montana. The majority are on national forest lands both within (4,117 miles) and outside (9,399 miles) the boundaries of wilderness areas. Glacier National Park has about 750 miles of trails, and Yellowstone National Park has about 1,000 trail miles (in Montana and Wyoming). There are thousands of backcountry lakes and streams with trout waiting to be caught. Montana's best hunting and photography opportunities lie beyond the end of the road. It all comes down to picking the area that offers the most of what you like best.

Preparation and Planning

One of the first things to think about in planning a backpacking trip is physical conditioning. If you cross-country ski, jog, or regularly engage in

photo: DAVE BOOKS

some other aerobic activity, you're probably in good enough shape for many trails right now. But if you don't take part in regular, vigorous exercise, it would be wise to start a preconditioning program at least a month or two before you plan on walking any distance with a full pack. Remember, you'll enjoy life on the trail much more if you are prepared physically. It's hard to have fun even in the most beautiful of mountain settings if you're sore and tired.

Once you're satisfied that you'll be in good enough shape for your trip, consider your feet. I've seen a lot of misery (blisters and sore feet) caused by improper selection of footwear. Some people have the impression that heavy, stiff, rock-climbing boots are absolutely required for backcountry travel. In my opinion, unless you are planning on doing most of your hiking on talus slopes or rock faces, they are the worst shoes you can wear. They are not practical for walking on maintained trails. What's more, they are nearly impossible to break in, and can cause world-class blisters.

A much better choice for a hiking shoe would be a light- to medium-weight leather boot with moderate flexibility and support. This type of footwear can be made fairly waterproof with leather sealants and should be more than adequate for most conditions.

If you expect mostly dry and well-maintained trails on your trip, you might want to consider wearing tennis shoes. I see more and more people "traveling light" with tennis shoes in the backcountry each year. They are flexible and almost never cause blisters. I've walked many hundreds of miles over a variety of trails in running shoes, or just plain old sneakers. I've even climbed peaks in tennis shoes, and I know many other people who have too. However, don't hike in them if you have weak ankles. Above all, select the footwear you feel most comfortable with, and make sure you break in your shoes before you go on your hiking trip.

Once you have your feet taken care of, think about selecting a backpack. It's important to have a pack that feels comfortable on your shoulders and hips. You also need to consider the type of frame and pack style that best fits your needs. There is a wide range of styles from which to choose, with prices ranging from $20 to $200. My advice would be to buy the most inexpensive pack you can find with the following features: a waterproof, multicompartment bag; a welded aluminum or magnesium frame; a sturdy, padded hip belt; and a good system of breathable pads which hold the frame off your back. Also, select a pack of the proper size for your body and for the length of trip you normally expect to take. Don't buy a huge pack if you're planning to use it mostly for overnighters. Backpacking is best enjoyed by traveling as lightly as possible, taking only the minimum of essentials necessary for your comfort. Remember, you are going into the backcountry to leave civilization behind, not take it with you.

MIKE LOGAN

Even though everything tastes great when it's cooked in the outdoors, a trout added to a backcountry dinner can be a real bonus.

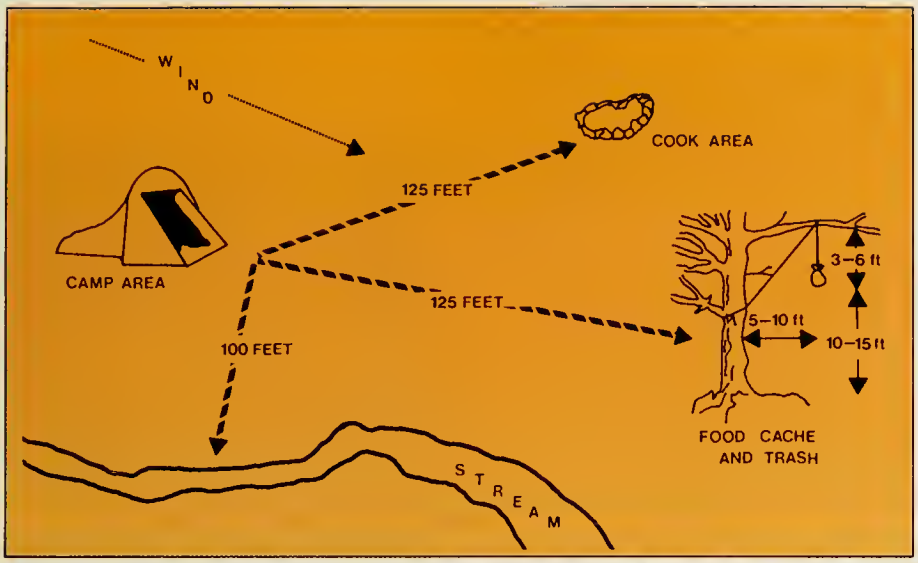
MIKE LOGAN

If you go into the mountains overnight, a lightweight nylon backpack tent is almost a necessity. Sleeping out under the stars can be a fine experience, but the mosquitoes can be thick and ravenous in the high country during the summer. What's more, a tent cuts the wind and conveys a sense of security. Like backpacks, tents come in a variety of sizes, weights, and prices. Selecting the tent best suited to your needs is largely a matter of common sense. For help in choosing a tent and backpack, check your library for "Backpacking Equipment: A Consumer's Guide," the equipment buyers' guide by W. Kemsley and the editors of *Backpacker* magazine. Recent editions of *Backpacker* have up-to-date information on new equipment.

Getting Packed

It's time to get down to the nuts and bolts of preparing for your backpack. What essentials do you need? How much food should you take? Will you have a campfire, or should you bring a lightweight camp stove?

Let's say you've decided on a hike to an alpine lake four miles from a major



After crossing that last rise in the trail, you've reached your destination. Choose your campsite carefully, because a comfortable backcountry camp provides some of the greatest pleasure of the backpacking experience. The illustration above contains some valuable tips.

trail head in the Mission Mountains Wilderness Area. You plan on hiking in on Saturday morning and hiking out Sunday afternoon after spending the night at the lake. First, make sure your pack contains the minimum essentials for a safe and comfortable trip. I recommend you don't go on any backpack trip without a carefully planned packet of emergency items and indispensables. You should also develop a checklist of major items: tent, sleeping bag, extra clothes, fishing rod, camera, etc. If you think you'd never forget such obvious items, think again.

Next, plan your meals. You will need lunch and dinner for the first day, breakfast and lunch for the second day, and snack items. A simple sample menu (amounts are per person): **One breakfast**—two envelopes instant oatmeal; one orange; Tang or other instant fruit drink; one envelope of instant cocoa. **Two lunches**—8 ozs. of snack crackers; 6 ozs. of cheese; 2 ozs. of dried fruit; two granola bars; 2 ozs. of peanuts; fruit drink. **One dinner**—8 ozs. dried macaroni and cheese dinner; two pieces of bread; celery sticks; instant chocolate pudding (4 ozs., with 2 ozs. dried milk); fruit drink. With luck, dinner could also include a baked or fried trout. **Snacks**—6 ozs. of gorp (a mixture made to your taste, but usually including nuts, dried fruit, and chocolate chips); two candy bars; apple.

This food adds up to about four pounds per person in total weight, and is available at most grocery stores. The cost? Less than $10 for four meals and snacks. Put all of your food into plastic "zip-lock" bags for convenience and organization.

Also remember to pack a multipurpose cooking pot, lightweight drinking cup, water bottle, and silverware. A roll of toilet paper from which you've removed the core can be a very important item. Take a backpack stove if wood will be scarce, if fires are restricted, or if you prefer not to cook on a fire.

Always take a topographic map (backed with contact paper) if you're visiting a new area. (Topo maps for the entire state are available for $2.50 each from: Montana Bureau of Mines and Geology, Room 200, Main Hall, Montana College of Mineral Sciences and Technology; Butte, MT 59701

VERN CRAIG

[406/496-4167]. A free index of topographic maps for Montana is also available.) National forest maps are fine, but they don't show the detail you might need, and they don't show relief. Take it from someone who has learned the hard way. On one of my first winter backpack trips during the early '70s, my friends and I tried to find a lake in the Scapegoat Wilderness Area using a fishing regulations map of the entire state of Montana. Even worse, we started out at the wrong trail head, led astray by inaccurate information in a commercial fishing guide. We never bothered to check with the Forest Service or someone who had been to the lake. Needless to say, we never reached the lake. We did manage to ruin three pairs of rented snowshoes, however, stumbling through downed timber and creek bottoms.

Now that you've made your preparations and checked your lists, get on the scale and hoist your pack. If it weighs more than 15% or 25% of your weight, take something out or replace it with a lighter item. As a general guideline, most experts recommend that an average man carry no more than 30 or 35 pounds. The average woman should shoulder less than 20 or 25 pounds. Use the 15% rule for kids. Don't be macho; remember, that pack might not feel so bad in your living room, but by the time you hit the third switchback in the afternoon heat, you may wish you would have left the can of beef stew or that six pack of beer behind.

Along the Trail

This may sound obvious, but before you head up the trail, be sure you are starting out at the correct trail head. Check before you go with the U.S Forest Service about the location, and look often at your topographic map once you're on the trail. You can't always expect a sign with the mileage to your destination. And don't forget to register if a trail head registration box is available.

Try to get an early start. You'll avoid the hottest part of the day, have more time to rest, and you won't have to force your pace. Remember Ben Franklin's wise words: "He who riseth late must trot all day."

Dress in layers. Usually you will experience a range of temperatures during the course of a day in the mountains. In Montana, you should be

prepared for winter in the middle of summer. Regardless of how nice the weather is supposed to be, always pack your rain gear. Buy reliable rain gear; being a miser can result in miser-y. Dressing in layers enables you to adjust to any conditions. Always carry extra socks and bring moleskin (a protective padding you can buy at any drugstore).

How fast should you hike? Adjust your pace according to the steepness of the trail, the nature of the trail surface, the amount of weight you are carrying, and your general physical condition. Most backpackers walk two or three miles per hour. Let common sense dictate your pace—don't be afraid to take it easy and enjoy the country. Remember, you travel only as fast as your slowest companion. If the members of your party are in reasonable condition, you should be able to cover eight to 10 miles per day on most trails.

Rest often along the trail, about five or 10 minutes per hour of walking. Experts advise resting *before* you get too tired for it to do you any good. When you stop to rest, drink some water and munch a few snacks. To be safe, bring drinking water with you, or treat it by boiling for five minutes or using purification tablets available at most sporting goods stores. If you rest frequently and continue taking water during the entire hike, you'll reach your destination in good condition and in good spirits.

Stream crossings are part of many trails. You can simply jump across many of them, or hop across them on rocks. If the stream is too wide to jump, look up and down the banks for a log on which you might be able to cross. If there isn't one, you'll just have to wade. Under no circumstances should you wade across the stream in your hiking boots. Once, a companion of mine waded streams with his boots on for the first few days of a week-long trip into the Bob Marshall Wilderness. By about the third day, he had developed very painful blisters because his wet socks chafed. To wade a stream, take your hiking boots off, take your socks off, roll up your pants, and "grin and bear it." Your feet might smart from the cold water while you are wading, but it will also feel refreshing. If the soles of your feet are sensitive, carry a pair of old tennis shoes for wading.

If you spend much time on Montana's major trails, you will eventually encounter pack stock. Horses and mules generally distrust backpackers, so the best thing to do when you see riders ahead is to go down below the trail as far as seems practical, and keep relatively quiet. Gently let the riders know you are there, and don't return to the trail until the pack string and riders are well past. Be careful and patient. I've seen a mule or two go over the side of a trail and spread its pack down the mountainside. You'll not be popular with the wrangler if, by moving suddenly or shouting, you cause something like that to happen.

Both the Forest Service and National Park Service recommend that you leave pets behind when you enter the backcountry. Dogs can disturb the experience of other backcountry users, and they can also harass wildlife. Another consideration: Bears and dogs don't mix. If you must take your pet into the backcountry, check with the Forest Service or Park Service about restrictions.

JOHN FRALEY

BILL PRYOR

A backcountry trip has much to offer: the chance to wet a line in an alpine lake, or to have your breath taken away by the magnificence of a view, or quiet conversation around a campfire.

BILL PRYOR

In summary, use common sense and common courtesy along the trail. If you see litter, pick it up. Don't do anything to disturb other parties. Get a good, early start. Take your time, take it easy, enjoy the sights, and have fun.

Backcountry Camping

You've crossed that last rise in the trail, and reached your destination. It's time to take a well-deserved break and look around for a campsite. Choose the site carefully—a comfortable back-

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OPERATION TROPHY KILL

by Randy Smith
illustrated by Diana Haker

It was a typical frosty October morning in Yellowstone National Park. The sounds of elk bugling in the darkness seemed to come from every direction as we checked and rechecked our equipment. I'm sure we were all a little tense as we started our vehicles and scraped frost from the windshields. The preparations were complete; it was time to go. We all knew it would not be a typical October morning for us.

I was one of 25 Montana game wardens, 30 U.S. Fish and Wildlife Service agents, 50 members of the National Park Service "Special Events Team," six U.S. Forest Service enforcement personnel, and 18 U.S. marshals who had spent the preceding four days at Mammoth Hot Springs near Gardiner, Mont. We were gathered at Mammoth this particular morning—Oct. 4, 1984—to take part in the conclusion of "Operation Trophy Kill." An additional 80 wildlife officers in other locations across the country were also participating.

"Operation Trophy Kill" was a three-year undercover investigation conducted by the U.S. Fish and Wildlife Service (USFWS) of black market wildlife operations in Montana and other states. In Montana, these black market operations involved illegal killing, smuggling, and selling of just about any wildlife species with monetary value. Market hunting and trafficking in illegal wildlife is nothing new, but in recent years it has evolved into a lucrative activity. For example:

- In Ohio, a few years ago, the state sued 45 individuals, asking $69 million in damages, for the illegal taking of almost half a million pounds of walleye from Lake Erie.
- In Oklahoma, wildlife authorities broke up a poaching ring illegally netting up to $3 million worth of catfish a year.
- In 1983, a two-year undercover operation resulted in arrest of a group specializing in poaching big game animals for profit in Colorado and Montana (see "Montana Sting," *Montana Outdoors,* May/June 1984).
- In June 1984, during "Operation Falcon," about 40 individuals were arrested in 14 states after a three-year undercover investigation centered in Montana. The group was buying and selling protected birds of prey such as the gyrfalcon, which are highly valued in Europe and the Middle East.
- Not even plants are safe from the plundering. Officials in Arizona

estimate that trading in illegal cacti is a $500,000-a-year business.

• In the western states, the Asian herbal-medicine trade has created a huge demand for elk antlers and bear parts because of their supposed medicinal properties and their uses as aphrodisiacs.

Another lucrative market has developed recently in the western states: trophy big game animals. Heads and capes of trophy whitetails, elk, mule deer, mountain goats, black and grizzly bears, and bighorn sheep can be worth hundreds, thousands, and even tens of thousands of dollars each, depending on their size. While trophy bighorns have been the big item in recent years, trophy whitetails now appear to be the coming thing.

To the average person, $10,000 or more for a trophy head seems unrealistic, and understandably so, because the average person couldn't find anyone willing to pay that kind of money for a trophy—even if he had such a trophy to offer. But someone involved in the commercial wildlife market has connections with the sort of people willing to pay big money. And many people are obsessed with possessing trophy heads. They are a status symbol; for some of these people, money is no object. Most people, of course, prefer to shoot their own trophies, but others don't care how they acquire them. When you consider the difficulty involved in even drawing a license or permit for some of these species and the $5,000 to $10,000 price tag for a guided hunt, you can see why some folks are willing to pay such outlandish prices for trophy heads.

With that much money involved, no wonder unscrupulous individuals and groups are trying to reap large profits at the expense of our wildlife. Such activities necessitate enforcement efforts such as "Operation Trophy Kill."

The "Trophy Kill" investigation initially resulted in charges being filed in Colorado and Montana against 34 people from various states, while many additional charges were filed later. In Montana, grand jury indictments were handed down in September 1984 for the arrest of 18 people, most of them living in the Livingston and Big Timber areas, with the rest living near Townsend. It was our group's responsibility to locate and arrest these suspects when the "takedown" began at 7 that October morning. Because of the multi-jurisdictional nature of this case (violation of both state and federal wildlife laws, as well as Park Service and Forest Service violations), it was a cooperative effort by federal, state, and county enforcement personnel.

Most of the officers involved in "Operation Trophy Kill" arrived in Mammoth Sept. 30. After a two-day refresher course in officer survival techniques given by the U.S. Marshal's Service, we were supplied details about the entire operation. We were then assigned to arrest teams with specific suspects. The size of each team varied, depending on the number of suspects to be arrested at a particular location and what was expected to happen in each encounter.

For the next two days, teams worked out details of each arrest until each of us was sure of his individual responsibilities. This meant reviewing the entire investigation, and studying volumes of investigative reports, transcripts of taped conversations, photographs of various suspects, and other pertinent material.

We learned the operation had begun in July 1982 when the USFWS created "Rocky Mountain Game Processors," a taxidermy and tannery business in Fort Collins, Colo. This shop, managed by "John Cummings" (USFWS Special Agent John Gavitt), served as the front for the undercover work.

Like any good business manager, "Cummings" advertised his new shop and had brochures and business cards printed. Things were slow in the beginning, like they are for most new businesses, and most of the work received was legal. Soon, however, "Cummings" received inquiries about taxidermy on items not so legal.

Contacts were also established through "Cummings' " dealings in the elk antler market. "Cummings" bought and sold many hard elk antlers to establish his credibility as a horn dealer. Just as in the taxidermy portion of the operation, the legal trade led swiftly to the illegal trade as he began to buy horns from elk that were in velvet and were being killed during the summer.

The number of contacts grew as one acquaintance led to another. Soon "Cummings" was receiving all sorts of illegal wildlife, from eagles to bighorn sheep. Some contacts also resulted from meeting and talking with the "right" people in area bars.

In addition to purchasing illegal wildlife, "Cummings" also made arrangements with some suspects to guide hunters (other undercover agents) on illegal hunts for trophy big game animals.

Gaining the confidence of some of these people was not easy, while others jumped in with both feet. Those slow to trust "Cummings" expressed concern about the current wildlife enforcement "heat" in the area and even the possibility that "Cummings" might be the undercover agent. Throughout the operation, several made it clear to "Cummings" and to other agents posing as hunters that there would be nowhere to hide if they turned out to be game wardens or federal agents. They made similar threats about any wildlife officers who might try to apprehend them or other persons who might inform on them.

So, we took every possible precaution as we prepared to make the arrests. We left Yellowstone Park at 4:30 a.m. and drove north through the darkness toward our various destinations in the Livingston and Big Timber areas. The teams bound for Townsend and other more distant spots left the night before. The plan was to put each team in position near the location of its suspect; at 7 a.m., the teams would move in and make the arrests.

The U.S. Marshal Service's Special Operations Group was standing by at the Park County Sheriff's Office in Livingston, in case any of the arrest teams had a problem, such as a barricaded suspect. A command post was also set up at the sheriff's office to coordinate all the teams in the area. As each team made its arrest, they would call the command post with a report. Those at the command post in Livingston would, in turn, report to a central command post in Washington, D.C. This central post coordinated all the arrests being made nationwide.

By 9 a.m., most of the 18 suspects had been arrested without incident. One suspect decided to roll around on the floor with a couple of federal agents who looked like middle linebackers, but to no avail. Another suspect fell asleep during his arrest because of a hangover. One officer was injured when his arrest team parked its vehicle on a small bridge on the lane leading to a suspect's house. When getting out of the vehicle in the dark, the officer stepped off the bridge and fell into the water and rocks below, fortunately without serious injury. He was later presented with an official "Operation Trophy Kill" assault vest—a life preserver with a rope attached. Another arrest team surrounded a trailer house in the mountains where the suspect was believed to be; as they approached the trailer in the dark, shots rang out in the distance. While they were attempting to make their arrest on one side of the hill, someone was poaching a deer on the other side.

After arrest, suspects were taken to the Park County Courthouse, booked, and arraigned before a U.S. Magistrate. Bond ranged from $25,000 to $350,000—the largest bond ever set in a wildlife case. Several suspects were not found immediately, but they were either arrested, or turned themselves in a short time later. After the arrests had been made, the interviews conducted, the reports written, and the evidence catalogued, we gathered up our equipment and returned home. Our job was finished.

The operation, however was far from complete, because the agents and prosecutors began the arduous task of preparing the cases.

Most of those arrested in Montana were charged under the Lacey Act, which elevates violations of state wildlife laws to federal offenses if interstate transportation or sale is involved. Other charges were filed under the Eagle Act, which protects bald and golden eagles. In Colorado, some Lacey Act charges were filed, but most violations fell under the Endangered Species Act because they dealt with exotic cats such as the leopard, jaguar, ocelot, cheetah, snow leopard, and Bengal tiger. In Montana, the violations involved scores of big game animals such as bighorn sheep, mountain goats, grizzly and black bears, elk, deer, antelope, mountain lions, as well as lynx, bobcats, and a couple dozen eagles. The federal agents posing as hunters on illegal hunts purposely missed numerous shots to avoid having to kill an animal, but still ended up taking two mountain goats, one mountain lion, an elk, and a deer. This was unfortunate, but necessary, to maintain their credibility with the suspects.

Although this was a federal case, it was also in large part a Montana case. Montana defendants were tried in Montana and a Montana judge presided at the trials. Montana's U.S. Attorney prosecuted the cases and was involved in the investigation from the start, and jurors were Montana men and women. The defense was the same as that used in almost every undercover investigation: entrapment. However, in the few cases that went to trial, jurors consistently rejected that claim; in fact, when questioned afterward, most jurors believed that an undercover operation was probably the only way to curb this kind of activity. Juries were fully aware of and approved the penalties imposed when they rendered their verdicts—which were the largest prison sentences to be handed down in a wildlife case.

A tally of sentences handed down in Colorado and Montana shows 46 convictions (as of September 1985), with over $120,000 in fines, 51 years of prison time (about 19 years suspended), over 95 years probation, and over 2,900 hours of community service. Most of the prison sentences were handed down in Montana, while large fines were more common in Colorado. All in all, it was a successful operation, but there are still those who believe that wildlife exists simply to enable them to be self-employed and they are operating in just about every area with trophy wildlife. If profits are

high enough, someone will be willing to take the chance.

The problem is similar to those faced in other areas of law enforcement dealing with organized criminal activity, such as drug trafficking. One of the most effective solutions is also the same: the undercover operation. It is difficult for wildlife officers using conventional enforcement methods such as uniformed patrol to discover and apprehend professional poachers. For a start, most uniformed wildlife officers are spread thinly, with responsiblity for huge areas. Uniformed officers are also highly visible, and relatively easy to keep track of and avoid. Professional poachers are much more likely to carefully plan their activities to avoid apprehension; if they should happen to get caught with an illegal animal, they would probably be charged with only that one violation. If convicted, they would probably receive a minimal fine.

The defendants in this case were often operating in rugged and remote backcountry, making it highly unlikely that anyone would see them or catch them. They would often enter the backcountry at one point and come out somewhere else, or have someone drop them off to hunt and then pick them up again later (usually after dark) at a prearranged location. They might stash their illegal prize just before coming out and then retrieve it later. The meat was usually left to rot.

In cases such as this, many people are often involved, and they may live in other parts of the state, in other states, or even in other countries. It becomes difficult for a local field warden to put it all together. The undercover operation solves many of the problems faced by the uniformed officer because the undercover agents work from the inside as trusted associates or accomplices of those involved in the criminal activity. This effective and accepted law enforcement tool is being utilized more and more in wildlife law enforcement with excellent results, especially in the area of commercial poaching.

The following steps would improve the effectiveness of wildlife law enforcement in Montana. First, we should strengthen wildlife laws to make it more difficult to traffic in illegal wildlife. We should raise the penalties for those caught. Montana, like most states, has laws prohibiting

the commercialization of the meat of game animals, game birds, waterfowl, fish, etc., which protected them from slaughter by the market hunters of the past. These laws should be expanded to prohibit commercialization of the parts of these animals, birds, and fish, to protect them from slaughter by today's market hunters. Some states have already done this to reduce the market for these illegal wildlife parts, which are now worth far more than the meat ever was. The effectiveness of related federal laws—such as the Lacey Act—are also increased when underlying state laws are strengthened.

Penalties should be increased to fit the crime and its profits. A simple fine of $500 or $700 is no deterrent to a professional poacher or a wealthy collector. Substantial jail sentences coupled with higher fines and forfeiture of hunting privileges at the state level will discourage not only the organized professional poacher, but also the small-time operator. Another deterrent used by both state and federal enforcement officers is forfeiture, on conviction, of equipment associated with committing the crime—such as aircraft, vehicles, boats, rifles, etc.

Montana's statute of limitations should be extended in commercial poaching cases to allow for more involved undercover investigations. These investigations can take a long time because of the large number of suspects, and the one-year limit for filing charges often runs out before the work is complete.

Montana should follow the lead of other states that seek additional civil penalties for each animal poached. These are assessed as compensation for economic loss to the state of its valuable wildlife resources.

These are all positive steps; however, they will be effective only when combined with an aggressive, well-trained, well-equipped, and adequately staffed and funded enforcement effort. A strong enforcement program is a necessary element of a successful wildlife management program, because it not only ensures compliance with licensing requirements which generate the dollars that fund the wildlife agencies of most states, but also helps preserve wildlife populations at desired levels by enforcing bag limits, quotas, and controlling illegal harvest.

Poaching has always been a drain on wildlife populations, but these large-scale poaching operations can have devastating impacts, especially when concentrated in small areas.

Commercialization of wildlife has once again become one of the most significant challenges wildlife officers face, but we are helping to meet that challenge through successful undercover investigations like "Operation Trophy Kill."

Professional poachers have no regard for wildlife or wildlife laws. They don't kill for the meat or the sport, they kill for the money. One "Trophy Kill" defendant, while negotiating the price for an illegal grizzly bear, said he should get more money for it because "griz" would be extinct before long. It is up to all of us to protect our wildlife heritage from this kind of thinking.

Enforcement officers depend heavily on the public. To supply information or report violations, call the local game warden, sheriff's office, or use the toll-free number in Montana, 1/800/332-6117. Montana now has a rewards program by which anonymous callers can be eligible for sizable cash rewards if their information concerning major wildlife violation results in arrest; call 1/800/TIP-MONT.

Montana's wildlife belongs to Montanans; poachers are simply thieves who steal from each of us. Help us fight back. ■

Goats: Spurge Scourge

Much can be said for animals eating plants that we humans call weeds. And a herd of goats on an island in the Yellowstone River these days is saying it best.

"It's biological control really," says Chuck Egan, Stillwater County extension agent. "You match up an animal that will keep a weed plant in check, and that's what we've done with domestic goats and leafy spurge."

The yellow-flowered leafy spurge plant was imported to this country from Europe. Away from natural controls that kept it in check, the spurge, indeed, "grew like a weed." A 42-acre island on the west end of Columbus became a grown-over site of yellow. It was covered with leafy spurge.

"We couldn't use chemical herbicides because our water source for the town comes from that island," says Egan.

Goats were known to eat leafy spurge, as do domestic sheep, so 12 of them were sent to the island as an experiment. They ate the flower of the plant everywhere it occurred so it couldn't go to seed. Goats seem to prefer spurge for the taste of its latex-based milk.

"We think it was pretty darned successful," says Egan. "Some dogs got into our spurge-eating goats and killed a couple, but unlike sheep they do sort of band together to protect themselves. We've had people give us goats to put on the island and now our band is up to 20. They've been on the island three years and have it nipped off real good. In fact, four little spurge-eating baby goats have been born out there."

On islands and river bottoms and isolated places where they can't get out, it seems like the goats are one answer to controlling this weed biologically. Goats don't eat the grass, but may eat some wild rose and willows and a few broad-leafed plants. But their favorite is the flower of leafy spurge. They seek it out among other plants and nip it off.

"We're going to take our goats on the road this summer," Egan says. "We've hired two students to act as herders and we'll be hitting the Fish, Wildlife and Parks fishing access sites up the Stillwater River."

Rick Johnson, who is in charge of weed control for the Department of Fish, Wildlife and Parks in southeastern Montana, believes the goats will help out on the access sites.

"We'll put the goats in the access sites and campgrounds to clean up the spurge," he says. "A grant from the Weed Trust Fund, set up by the last state legislature, is helping us do this. We don't like to use herbicides where it can run off into water and where folks and their small children are around campgrounds. The goats seem to have done real well at these campground sites. They're only there three or four days, and then we move them."

Goats are proving through this project that they can keep leafy spurge from going to seed. Using them is an advantage over domestic sheep, which also like spurge, because goats will get under the wild rose bushes and not wind up with the "stickers" all over their coats. They also may be eating the early-stage plants of Canada thistle and spotted knapweed.

The Columbus island experiment with goats is one example of working with nature to control runaway plants (weeds, as we know them) biologically. Other experiments, again centering on leafy spurge, are also in the works.

"There are two moths we're trying to get established around the Stillwater," says Egan. "The hawk moth larva feeds on the foliage of leafy spurge, while the Oberea moth larva feeds on the roots. Oberea will feed all the way down on those roots until there's not enough root for them to travel on anymore. Then bacteria and other diseases can enter the root and finish the spurge plant off."

BRENT WILCOCK

The introduction of these two moths was the brainchild of Dr. Norman Rees, an entomologist with the Agricultural Research Service at Montana State University's Agricultural Experiment Station in Bozeman. The moths are natural predators of spurge that have been brought over from Europe to reproduce and populate the area around the Stillwater in hopes of controlling its leafy spurge.

Dr. Rees has even dug up leafy spurge plants that were growing in the Stillwater River country and transported them to Rome, Italy, where they now are growing. Insects that are the plant's natural predators are collected off those plants. They are identified and, after making their way through proper channels, will end up at MSU to reproduce and be released as further biological controls against the yellow fields of leafy spurge.

Goats and moths are just now beginning to be used as control agents against weeds. The reason is that development of these methods take a great deal of time.

"Biological control and the effort that goes into raising these animals, seeing to it that they multiply and spread to control these plants, is terribly slow," says Egan. "But it's one of the tools we need to use in our fight against man's weeds. Using chemicals sparingly, along with good management, we can try to keep weeds in check while the biological controls are coming on."

The goats, munching complacently on the yellow-flowered spurge, don't know they're biological control agents. They just know they're getting plenty of what they like to eat.

And, the island west of Columbus in the Yellowstone? "It's sort of come to be known as Goat Island now," says Egan.—*Bill Pryor, Region 5 (Billings) information officer*

Take a Quack At This Contest

The Department of Fish, Wildlife and Parks is looking for art to grace its 1987 duck stamp. This is the second year for the state waterfowl stamp and the art contest.

Redhead ducks are the featured bird, and only Montana residents can enter the contest.

The 1985 Montana Legislature author-

ized the stamp. Proceeds from sale of the stamp, art prints, and associated items will be used to fund state waterfowl programs.

Starting this fall, duck and geese hunters need to have the Montana waterfowl stamp, in addition to a federal duck stamp and a Montana game bird license.

If you are interested in submitting art, contact: Don Childress, waterfowl coordinator, Department of Fish, Wildlife and Parks; 1420 E. Sixth Ave.; Helena, MT 59620 (406/444-2612), and ask for a "Request for Proposal" which details the stamp contest.

Other criteria include:

- The art must be a 13- by 18-inch, full-color rendition.
- It must be an original piece not used or entered in competitions for any other state or federal waterfowl program.
- The art can be mounted or matted, but must not be framed or under glass.
- The art should be enclosed in a protective mailing carton. Deadline for submitting art is 5 p.m. Oct. 15, 1986.

Paying the "Rent" For Sleeping Bears

Two Montana organizations concerned with the welfare of the state's wildlife recently reached into their pockets to show how much they really care—in this case, about black bears.

During February, a Cascade-area rancher contacted local game warden Stan Peck to report that at least two black bears had found what they evidently believed to be a perfect spot to den and sleep away the winter—one of the rancher's haystacks. The rancher discovered the bears' comfortable abode while retrieving some hay bales to feed his cattle.

Faced with the prospect of disturbing the bears from their midwinter naps, the rancher called Peck to see what the next step might be.

Peck put in motion a series of events that led to the Montana Bowhunters Association and the Great Bear Foundation each donating $100 to the rancher for an alternate source of hay, if he would allow the bears to slumber away the rest of the winter in the haystack and leave of their own accord in spring.

Peck reports the bears vacated their winter "rental," and ambled back to the nearby mountains early this spring.

Audubon Council Picks Winners

Each year, the Montana Audubon Council presents two awards for journalism: one for a feature article in a magazine, and the other for newspaper coverage of conservation topics.

Larry S. Thompson was named winner in the magazine category for "Birding—The Sky's the Limit," from the Nov./Dec. 1985 issue of *Montana Outdoors*. He is a member of Helena's Last Chance Audubon group.

Recipient of the newspaper award is Bert Lindler of the Great Falls Tribune, for his articles about endangered and threatened wildlife species in Montana.

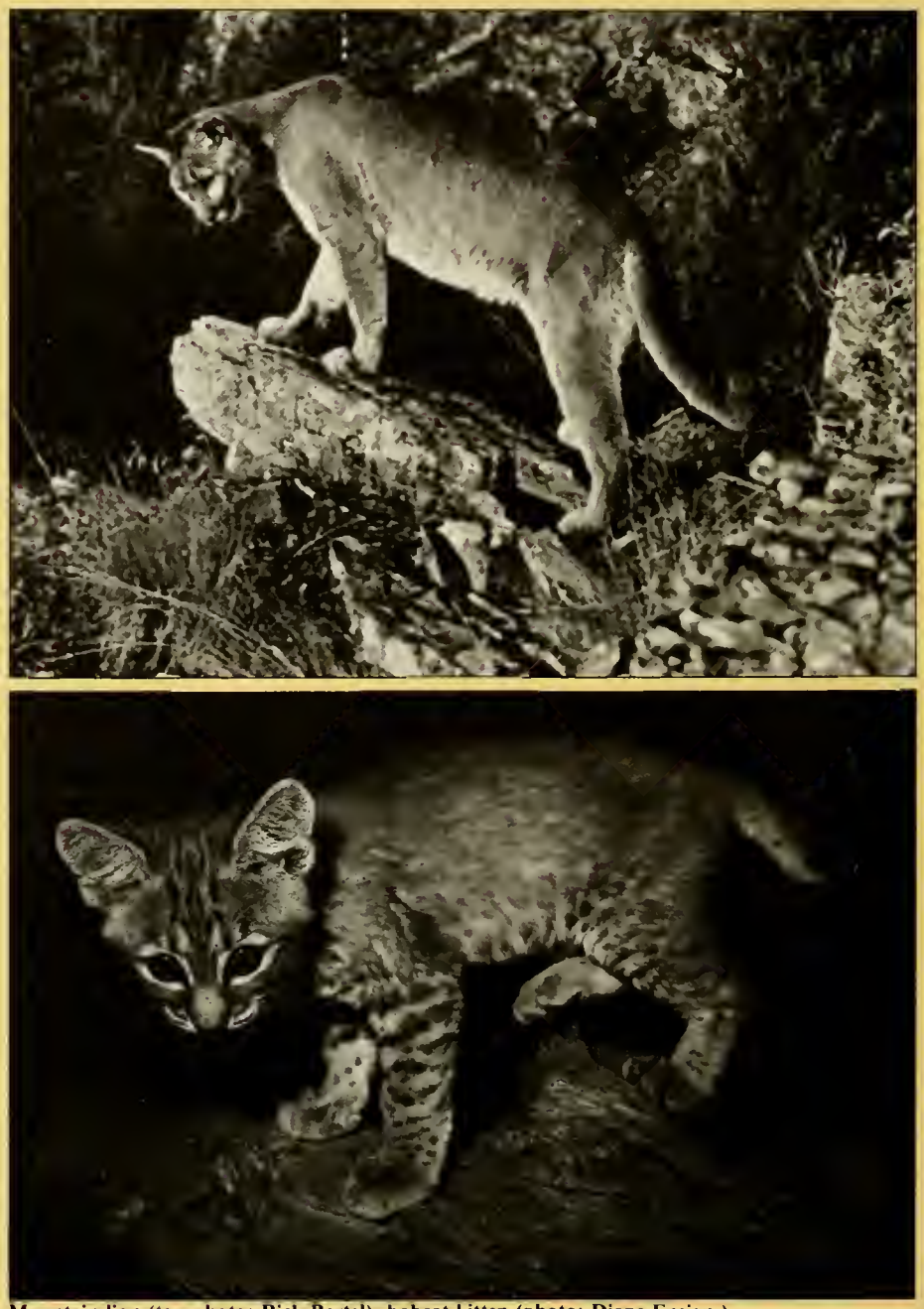
The two received their awards at the council's May meeting.

Pictures in July

The Lone Pine State Park and Visitor Center near Kalispell is hosting Montana's largest nature and wildlife photography show July 18-19.

Professional and amateur wildlife and nature photographers from across the state will be on hand to display their prints, calendars, cards, and books. Some of the photographers to look for include: Rick Bartel, Diane Ensign, Lou Kis, Tom Ulrich, Steve Wirt, William Munoz, and Joe Potoczny. There is no admission charge.

Lone Pine State Park and Visitor Center sits on a high ridge five miles southwest of Kalispell. The park is noted for its spectacular view of the entire Flathead Valley, surrounding mountain ranges, and waterways. Park facilities include a picnic area, an interpretive nature trail, equestrian trails, and the Visitor Center.



Mountain lion (top photo: Rick Bartel), bobcat kitten (photo: Diane Ensign.)

NONGAME NEWS

THE FROG WITH A TAIL

One of the most primitive frogs in the world is also one of Montana's most unusual nongame animals—the tailed frog *(Ascaphus truei)*.

The "tail," found only on the male, is not really a tail, but an external extension of the vent used for copulation. The tailed frog is the only frog in the world to have internal fertilization of eggs—an advantage in the fast-flowing mountain streams where it lives.

Tailed Frog

graphics: LARRY COPENHAVER

The rest of the breeding cycle is also very unfroglike. Tailed frogs mate in fall, instead of in spring like others of their kind. After mating, the female stores the sperm in her uterus throughout the winter. In spring, fertilization takes place as eggs are laid.

The eggs of the tiny two-inch-long frog are proportionally large—roughly one-fourth of an inch in diameter. The tadpoles that hatch one month later are unlike other tadpoles. They don't have gills, because they can absorb plenty of oxygen without them in the cold, flowing water. Their mouths are modified into larger, suckerlike organs, used in clinging to rocks. They have rows of tiny teeth to scrape food off the rocks.

Adult tailed frogs are unusual in other ways as well. The males have no voice, and both sexes lack ear drums, Eustachian tubes, and stapes (a small bone in the middle ear of amphibians). Their lungs are very small, and they can't even stick out their tongues.

These unusual frogs are found only in the Pacific Northwest; their range extends as far east in Montana as the east slope of the Rockies.

DID YOU KNOW...

- The deer mouse is the most common and most widely distributed small mammal in North America.
- An "axolotl" is a tiger salamander which remains in a permanent larval stage, retains external gills throughout its life, and is found only in lakes at the upper altitudes of its distribution.
- Painted turtles, common in shallow ponds and slow streams, hibernate during cold weather and lay one or two clutches of eggs during May to July.
- Wyoming pocket mice, found in sagebrush habitat of eastern Montana, store food in external, fur-lined cheek pouches.
- Dippers (water ouzels) have specialized adaptations for their semiaquatic life style. A movable flap over the nostrils keeps water out and a nictating membrane protects their eyes.
- There are no moles in Montana; the runwaylike mounds or casts one sees are made by pocket gophers.
- The ears of owls are asymmetrical—they differ in size and in location relative to the ear openings. This helps owls detect direction and distance of sounds made by prey.

READER POINTS OUT THE ERROR OF OUR WAYS...

In the "Nongame News" section of the May/June 1986 issue of *Montana Outdoors*, you published an informative piece on the American Ornithologists' Union's recent decision to split the western grebe into two species—the western and Clark's grebes. Please note, however, that you reversed the correct names for the two species. The newly named Clark's grebe is the *light* morph or phase, whereas the western grebe is the *dark* morph. Thus, it is likely that the western grebe is the more common of the two species in Montana, because Clark's grebes tend to be distributed farther south.

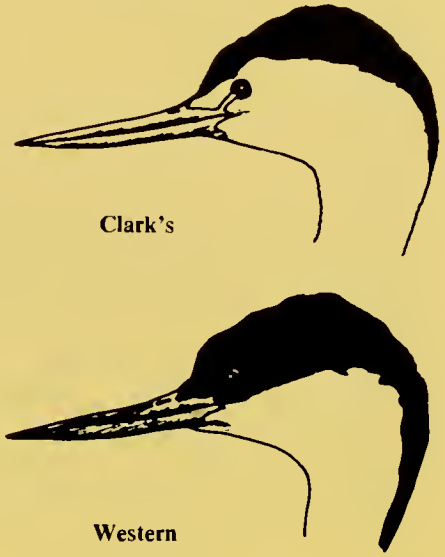
Despite this initial confusion, I suspect your article will be helpful in alerting birding enthusiasts to scrutinize "western" grebes, and I applaud your efforts in enlisting the birding public to help define the distribution of two important nongame species.—*Jeff Marks, Bureau of Land Management; Boise, Idaho*

AND WE RESPOND...

You, of course, are right—we messed up. The two species were inadvertently reversed in the article.

The western grebe, *Aechmophorus occidentalis* is the dark phase; the one with the eye surrounded by black feathering. It is the one most commonly seen around Kalispell and the species we believe is most common in Montana.

Thank you for bringing this error to our attention. We encourage other interested readers to submit comments or suggest potential topics for future installments of "Nongame News." Contact Dan Casey or Mike Aderhold, Department of Fish, Wildlife and Parks, P.O. Box 67; Kalispell, MT 59903.



Clark's

Western

THE VALUE OF A "DICKEY BIRD"

Montana's many species of nongame birds have a wide range of values. Their presence enhances the many outdoor recreational activities our state residents and visitors enjoy. Their biological value includes the part they play in the stability of natural ecosystems. But nongame birds also have a frequently overlooked economic value: Many species eat insects, so they help regulate populations of insect pests.

Although few studies have been done in Montana, research elsewhere in the West shows that birds help protect both agricultural crops and timber resources. Birds usually play a part in the constant suppression, rather than outright control, of insect pests. In cases of severe outbreaks of insects, however, birds often shift their diets to capitalize on abundant insect prey.

The best example is the grasshopper. Researchers noted over 170 species of birds—from hummingbirds to hawks—feeding on grasshoppers during a massive outbreak in Nebraska. Yellow-headed blackbirds, Franklin's and California gulls, and western meadowlarks (Montana's state bird) have been credited with control of local grasshopper and cricket explosions elsewhere in the Rocky Mountain region. Researchers found one

meadowlark stomach with 1,000 young grasshoppers in it.

Other nongame birds which control insects in agricultural crops include Brewer's blackbirds controlling cankerworms in California, crows controlling climbing cutworms in California, and both swallows and bobolinks feeding on moths and other pests in Florida. One researcher estimated that sparrows consumed over 1 million aphids a day at a single farm in North Carolina. In some cases, agricultural practices can be planned around bird feeding patterns; in Manitoba, plowing to expose white grubs led to 90% being eaten by gulls, terns, crows, and blackbirds.

Birds also help control forest insect pests. One Colorado study showed that woodpeckers were the primary biological factor controlling Engelmann spruce beetles. In one innovative study in Washington, the economic value of bird predation on spruce budworm larvae was calculated (see "How Much is an Evening Grosbeak Worth?" *Journal of Forestry,* July 1984). Researchers found that birds decreased budworms by about 70%, and that in the absence of birds, budworm populations jumped from 17% to 280% per year.

By comparing these figures with costs of pesticides to achieve the same results, the net value of bird predations was calculated at $182 per acre, or 23% of the net value of a square kilometer of timbered land in the study area. The authors concluded that timber management practices which benefit nongame birds may actually help preserve timber values on those lands.

NIGHT GLIDERS

Bats are not the only flying mammals you might see in Montana. Some night while you are out in the woods, look for a squirrel-sized animal climbing and gliding from tree to tree. If you are lucky enough to spot one, you will be witnessing one of Montana's most unusual creatures, the flying squirrel.

A member of the only nocturnal group within the squirrel family, *Glaucomys,* flying squirrels *(G. sabrinus)* have much larger eyes than other squirrels. They don't really fly, but glide downward from tree to tree. they cover considerable distance—six to 30 meters—with the help of a folded layer of loose skin that runs from front leg to hind leg along each side of their bodies.

Flying squirrels are among the most carnivorous members of the squirrel family. Foraging over several acres, they consume insects, other invertebrates, birds, eggs, nestlings, and carrion. They complement this meat diet with berries, nuts, seeds, fruits, and other plants. Of course, flying squirrels are not immune from being eaten themselves; potential enemies include owls, bobcats, raccoons, weasels, and domestic cats.

STEVE WIRT

Red-breasted Nuthatch

These unique creatures live up to five years. They prefer nesting in tree cavities, such as woodpecker holes with entrances only 40 to 50 millimeters in diameter. In addition to their primary nest (one used continuously), they utilize secondary nests for feeding, shelter, and defecation.

Adult flying squirrels make sounds similar to chirping birds— a "chuck, chuck, chuck," a high-pitched "tseet," and a soft, sneezelike call. Young squirrels emit high-pitched squeaks and possible ultrasonic sounds, which they might use for echolocation as bats do.

Flying squirrels inhabit a wide range of habitats in western and south central Montana. Look for them in streamside cottonwood communities, open Douglas-fir stands, and at even higher elevations where whitebark pine trees become stunted because of wind and snow.

BAT HOUSES

Artificial roosting boxes for bats have been popular in Europe for more than 60 years. The idea is spreading fast in the United States where many common bat species will occupy man-made bat "houses." Providing artificial bat roosts is increasingly important as bats lose traditional roosting sites in old trees and buildings.

Fourteen species of bats occur in Montana, including eight species of *Myotis* or "mouse-eared" bats. The most widely distributed bat in Montana is the little brown myotis. Several species of *Myotis* and other cavity roosting bats such as the silver-haired bat, big brown bat, and Townsend's big-eared bat will use man-made bat houses.

All bats in Montana are insect eaters. They help man because they eat a variety of insects that damage crops and trees, not to mention reducing mosquito populations. Bats often feed near water where insects congregate. Bat houses within a half-mile of a lake, pond, or river are more likely to attract tenants. Bat houses should be placed from 12 to 15 feet above the ground and sheltered as much as possible from wind.

Small roosting boxes for bats are easy and inexpensive to construct. Use rough-cut lumber ½ to ¾ inch wide and leave an entrance crack at the bottom. Bats crawl up the roughened wood surface to roost during the day in the security of the box.

Roosting boxes at high altitudes or in northern latitudes such as Montana may require maximum use of solar heating to attract bats. Place houses in a sunny spot and cover them with tar paper or pieces of dark shingles to attract the sun and help warm the houses. Nursery colonies of female bats with young prefer stable temperatures in the 80° to 90° range.

If you are interested in attracting bats, detailed plans for several types of bat houses and suggestions on where to place them are available from: Bat Conservation International, University of Texas; Austin, TX 78712. In addition to simple boxes, plans for larger bat "condos" designed to accommodate colonies of larger bat species are also available. Supplying shelter for bats is not only good conservation, but also fun and educational. Like watching bird houses, seeing bats fly in and out of a home you have provided is rewarding. Bat houses also provide stimulating conversation pieces when your neighbor tells you that you forgot to cut the hole in your bird house.

GOOD READING

Non-Consumptive Use of Wildlife in the United States, U.S. Fish and Wildlife Service, Research Publication 154. Available from National Technical Information Service, 5285 Port Royal Rd.; Springfield, VA 22161, 1984, 20 pages, free.

A Guide to Hawk Watching in North America, by Donald Heintzelman, Pennsylvania State University Press; University Park, PA 16802, 1982, 256 pages, $9.75 (paper).

Suburban Wildlife, by R. Headstrom, Prentice-Hall, Englewood Cliffs, NJ 07632, 1984, 232 pages, $8.95 (paper).

A Guide to Wildlife Viewing in Alaska, Nongame Wildlife Program, Alaska Dept. of Fish and Game, 333 Raspberry Rd.; Anchorage, AK 99502, 1984, $12.95.

Proceedings—Workshop on Management of Nongame Species And Ecological Communities, Dept. of Forestry, University of Kentucky; Lexington, KY 40546, 1985, $5.

A Guide to Urban Wildlife Management, National Institute for Urban Wildlife; Columbia, MD 21044, 1984, 41 pages, $3.

A Park Made Visible

story and photos by Paul Pacini

During its brief five-year history, Spring Meadow Lake State Recreation Area near the west edge of Helena's city limits has become extraordinarily popular. Although it may be a relatively recent addition to the state park system, it is by no means a "Johnny-come-lately" to human use.

The Helena Valley in which the park is located is a flat spot on the eastern shoulder of the Continental Divide known to many early peoples. The valley was often used by nomadic natives as a rest stop along their migration routes.

The Missouri River, flowing along its eastern edge, provided a north-south transportation corridor and the valley itself was a portal to mountain passes, some leading west over the Continental Divide, others leading north or south, and even others east onto the Great Plains.

During the 18th century, the Helena Valley provided buffalo for the Salish Indians residing in the headwaters of the upper Missouri Valley. These natives seasonally returned through the Helena Valley to harvest buffalo even after 1800, when the Blackfeet seized the Missouri uplands from the Salish, pushing them west of the divide. The Blackfeet word for the valley was "tona," which translates roughly as "game pocket."

The valley remained a zone of passage well into the 19th century for the Salish, the Nez Perce, the Shoshoni, the Plains Pend Oreille, as well as for the Blackfeet who militarily

Reclaimed from a sand and gravel operation, Spring Meadow Lake provides water-based recreation for Helena-area residents. The Montana National Guard 1063rd Engineer Company (below) donated heavy equipment and operators to contour the shoreline.

controlled the valley, more by reputation than by occupation.

Into this tribal flux came the first white explorers and fur trappers. In July of 1805, Capts. Meriwether Lewis and William Clark led two contingents around the Great Falls of the Missouri, beyond the Gates of the Mountains, and into the Helena Valley from the north. Clark, commanding an overland party up the Missouri River, described his passage into the Helena Valley on July 19, 1805:

> a fine morning I proceeded on in an Indian Parth [path] river verry crooked passed over two mountains saw several indians camps which they have left this spring. Saw trees peeled and found poles etc. at 11 oC [o'clock]. I saw a gange of elk, as we had no provision concluded to kill some. Kill two and dined being oblige to substitute dry buffalow dung in place of wood...passed a butiful creek [Prickly Pear Creek] on the st [starboard] side tyhis eveng which meanders thro' a butiful vallie of great extent...my feet is verry much brused and cut walking over the flint, and constantly stuck full [of] Prickley Pear thorns, I puled out 17 by the light of the fire to night we camped on the river same side musqutors verry troublesome.

Capt. Lewis, leading the expedition's flotilla up the Missouri River behind Clark's party, wrote about the Helena Valley on July 21, 1805:

> the grass near the river is lofty and green that of the hill sides and high open grounds is perfectly dry and appears to be scorched by the heat of the sun. the country was rough mountainous and much as that of yesterday untill towards evening when the river entered a beautiful and extensive plain country of about 10 or 12 miles wide which extended upwards further that the eye could reach this valley is bounded by two nearly parallel ranges of high mountains which have their summits partially covered with snow. below the snowey region pine succeeds and reaches down their sides in some parts to the plain but much the greater portion of their surfaces is uncovered with timber and expose either a barren sterile soil covered with dry parched grass or black and rugged rocks. the grass in these extensive bottoms is green and fine, about 18 inches or 2 feet high. the land is a black rich loam and appears very fertile. we encamped in this beatifull valley on the Lar [east] side....

Spring Meadow Lake State Recreation Area hosted the swimming leg of the Universal Challenge Triathlon last summer.

Between 1810 and 1860, Native Americans and whites alike used the Helena Valley as a transit zone, even though the militant Blackfeet maintained nominal control. That pattern began to change in the early 1860s with discovery of placer gold lodes in central Montana gulches. Strikes at Bannack (1862) and Alder Gulch (1863) prompted adventurers to prospect other ravines. The Helena Valley was an easy route between initial strikes at Montana City, to the south, and Blackfoot City and Silver City, to the northwest.

On July 14, 1864, a foursome known as the "Four Georgians" discovered gold in what is now Last Chance Gulch, Helena's main street. Another strike in December of that year in nearby Confederate Gulch established the Helena Valley as one of the earliest population centers of the fledgling Montana Territory.

In 1874, Helena became the territorial capital of Montana; by 1890, Helena, the "Queen City of the Rockies," presented an unusually cosmopolitan demeanor. It served as the transportation, mercantile, financial, social, and political focus for the state. At that time, Helena reportedly sported more millionaires per capita than any other community in the nation.

Throughout this sojourn of Indian moccasins, buffalo hooves, early explorers, fur trappers, prospectors, and millionaires, about 56 acres of the Helena Valley was little noticed by those passing through. As with a blanket spread out for a picnic lunch, one seldom observes the weave of a select square inch.

But in 1928 this "square inch" was noticed, and the serene atmosphere of cottonwoods, willows, and grass along the banks of Ten Mile Creek bowed to the steel jaw of the power shovel. What would become Spring Meadow Lake State Recreation Area in another half-century was for this moment an operating gravel pit, Helena Sand and Gravel Company. (A sand and gravel company operating under the same name is not related to this early operation.)

The "spark" that gave the gravel pit its start was a devastating fire in 1928

which destroyed portions of downtown Helena. Sand and gravel were crucial to post-fire reconstruction. Local contractors Charlie Jacoby and his son George were hired to do much of the cleanup. They purchased a power shovel to clean out basements filled by burned and collapsed material.

When the cleanup was complete, George entered a partnership with Archie Bronlow in his small gravel pit west of Helena, where the power shovel was put to good use. Jacoby eventually bought Bronlow out.

W.T. "Mac" McCullough, who sold much of the heavy equipment to the partners in the gravel operation, remembers the track-driven, gas-powered Speeder shovel originally used to extract gravel. In fact, as he pointed out, it is still parked in Helena. In 1946, as the excavation deepened, a dragline was stationed on a concrete foundation near the excavation. From a 120-foot vertical steel boom near the foundation and power plant, a steel cable extended about 700 feet across the existing lake, to a sheave block-mounted between two railroad flatcars. This mobile platform ran on a dual set of conventional rails for a quarter-mile, in a semicircle along the north side of the property. Only 200 feet of rail was used at a time. It would be laid and re-laid just in front of the slowly advancing flatcars. A four-yard dragline bucket was mounted on the cable. Powered by a 200-horsepower electric motor, this bucket carved out nearly three tons of sand and gravel per scoop. The gravel was crushed on site and washed with water pumped from South Pond, which had been excavated for just that purpose.

Most of the gravel mined by the original Helena Sand and Gravel Company was sold to the railroad for ballasting (a technique of laying ties on a prepared gravel bed rather than on the natural soil base). The ready-mix operation required a large amount of sand and gravel for local concrete needs. According to Art Cummings, who operated the dragline during the 1950s, some of the gravel was loaded onto waiting railroad hopper cars during the mid-1930s and shipped as far as 350 miles for construction at Fort Peck Dam and in the town of Fort Peck.

As the dragline bucket dug deeper, the mobile platform was swung along its arc, exposing more spoils to the reach of the operator. This arc, resembling that of an auto's windshield wiper, can be seen today in the shape of the lake. The cavity immediately filled with water from underground springs. Cummings commented he had to work "blind," with his bucket submerged in water down to 90 feet before unusable clay deposits were encountered.

In 1957 or thereabouts, Bill Carson purchased the gravel operation from George Jacoby. Under Carson's direction, a power shovel was again used to carve out the channels and islands which exist today on the east side of the lake. Cummings, who operated that shovel, remembers his instructions were to create fish habitat—so recreational use at Spring Meadow Lake is nothing new.

Carson died in October 1964, and the Helena Sand and Gravel was closed down—but a lake was born. It was a 20-acre liquid gem, filled with largemouth bass, rainbow trout, perch, and painted turtles (most likely transplanted illegally by well-meaning fishermen).

A sculptor will tell you that form exists within the block of stone; the sculptor's task is to find the form and bring it to life. Within this 56-acre piece of ground there existed a lake, and the gravel operation was only a tool to brush away the sand and gravel that concealed it.

For nearly two decades, this world within a world rested, and the new life spread.

The living green hue of grass healed the dirt roads and other areas trampled and denuded by work boots, tires, and steel tracks. Tender willow shoots and cottonwood sprouts began to emerge through the shoreline gravel, producing a shaded tangle of branches and leaves and providing shelter for songbirds, waterfowl, muskrats, and beaver. But its visitors were few, because it was still private land and permission was required.

On Aug. 8, 1981, the cycle was completed.

Spring Meadow Lake was purchased by the state of Montana as a state recreation area. Through its re-creation, we are renewed.

Epilogue

December 1980—What was to become Spring Meadow Lake was proposed for acquisition as a state park with Coal Tax funds. The 1981 Legislature authorized the purchase.

August 1981—The state of Montana bought Spring Meadow Lake from Reber Realty and Development Company, Helena. The site was to be operated by the Department of Fish, Wildlife and Parks as a state recreation area.

November 1981—A survey in Helena's Independent Record tried to determine how the public would like to see Spring Meadow managed. There was strong sentiment to maintain the lake's natural amenities.

April 1982—A site plan was developed and released by the DFWP at the April Lewis and Clark County Parks Board meeting.

Summer 1982—The DFWP solicited additional public comments and recommendations from local service clubs and organizations.

January 1983—A budget request was submitted to the 1983 Legislature; $90,000 in Coal Tax Trust funding was appropriated but not spent because of a shortfall in interest revenue. (The interest earned from this trust fund is all that can be spent for parks acquisition.)

Winter 1983-84—The Spring Meadow Lake Development Committee was formed, with Joan Poston and Janice Hollow of Helena as co-chairs.

May-August 1984—The committee raised about $4,500, which was used to construct a trail around the lake, and to build two footbridges and picnic tables along the trail.

September 1984—Volunteers from the community constructed the trail loop and footbridge. Materials were either donated or purchased with Development Committee funds.

January 1985—An additional budget request was submitted to the 1985 Legislature. The Legislature approved an appropriation of $125,000 to accompany the $90,000 appropriation unspent in 1983.

May-August 1985—The Montana National Guard 1063rd Engineer Company donated heavy equipment and operators to contour the steep shoreline. The Mountain Bell Telephone Pioneers and other volunteers thinned brush to improve water access along the north shore. Volunteers also maintained the trail and bridges.

August 1985—Final architectural work was done in anticipation of the initial development phase to begin in August 1986.

October 1985—The 1063rd Engineer Company of the Montana National Guard returned to finish heavy equipment work started in May 1985.

The Future—Spring Meadow Lake State Recreation Area will receive the addition of public facilities when funding is available.

* * * * *

Historical information came from:

Walter, David A., "Historical Survey: The Prickly Pear Valley North of Helena, Montana," Montana Historical Society Library, January 1980, 23 pages.

Thwaites, Reuben Gold, "The Original Journals of the Lewis and Clark Expedition, 1804-1806," eight volumes, Dodd, Mead, and Company, New York, 1904; Vol. II, Part II, pp. 250-251, 254-256.

Special thanks to these Helena residents who graciously shared their personal recollections about Spring Meadow Lake: Art Cummings, W.T. "Mac" McCullough, Bob Hart, Frank Gruber, Patty Lefferdink, Mrs. William F. Long. ■

Flathead Lake's

by Loren L. Bahls
illustrated by
Monte Dolack

When you're 8 years old, you can believe all kinds of stuff. Especially about a mysterious lake in a big, faraway place called Montana. So naturally when I was 8 and my Montana cousin Frank and his folks came to St. Paul for a visit and the topic of conversation was Flathead Lake—I believed.

"Bottomless! No doubt about it," boasted Frank. "They don't have a line long enough to reach the bottom. And have you heard about The Monster? It's at least 50 feet long and's got flippers and a long neck like in those

Midlife Crisis

pictures of fish-eating dinosaurs."

Frank's dad sat through many such Montana folklore sessions, nodding matter of factly, and often tossing in a tidbit of his own. Who was I, mere Minnesota mortal, to question these truths? Weren't they uttered by real Montanans?

Today, I'm not quite so gullible about what people tell me about Flathead Lake. In between, I've taken a couple college courses on limnology (the study of lakes) and have learned to ask for evidence and to apply some reason and logic to my thinking.

So when Dr. Jack Stanford announced in 1983 that Flathead Lake was in trouble, I was skeptical. That

summer, Flathead produced its first lakewide bloom of blue-green algae—not a massive "so-thick-you-can-walk-on-it" bloom, but a visible accumulation nonetheless. Stanford read this as a sure sign the lake was on the brink of change—a change for the worse.

Jack Stanford is the latest in a series of successors to Morton J. Elrod, first director of the University of Montana Biological Station at Yellow Bay on Flathead Lake. Stanford is an authority on Flathead and a scientist of international reputation.

Like all lakes, Flathead Lake has a finite life span. Sediments washed from adjacent watersheds collect on lake bottoms in much the same way that grit collects in the trap under your kitchen sink. Along with the sediments come the nutrients that give life to lakes. Sooner or later, lakes fill with sediment or are choked with aquatic vegetation and cease to be lakes.

Left alone, most lakes will age very slowly. This natural process is called "eutrophication." Sometimes it will take many thousands of years, progressing through stages of youth (oligotrophic), middle age (mesotrophic), and old age (eutrophic).

But lakes age much faster when people inhabit lake basins in large numbers, dump their treated but nutrient-rich wastes into streams and rivers, and manipulate watersheds to produce their needs and wants. This accelerated rate of aging is called "cultural eutrophication."

As Dr. Stanford has explained to many audiences since that summer of '83, Flathead Lake is in the throes of cultural eutrophication. Until white settlement in the Flathead Valley, Flathead Lake probably had changed imperceptibly since the last big valley glacier retreated from northwestern Montana 10,000 years ago. But now the lake is changing before our eyes, from the purity of youth toward the corpulence of middle age. And implications of this change are serious.

The nutrients and algal blooms that accompany eutrophication bring with them a reduction in water clarity. Viewing the lake bottom through 20 or more feet of crystal clear water could become a fond memory.

Heavy blooms of floating or suspended algae may pose a threat to the health of people, pets, and livestock. The blue-green alga that bloomed in Flathead Lake in 1983 and reappeared in smaller numbers in 1985 was the same species *(Anabaena flos-aquae)* that has produced toxic blooms in recent years in Hebgen, Nelson, and Canyon Ferry reservoirs (see "Those Bloomin' Algae," *Montana Outdoors,* July/August 1985).

In 1983, Flathead Lake produced its first lakewide bloom of algae—a sure sign the lake was on the brink of a change for the worse.

Flathead Lake residents have noted an increase in shoreline "slime" over the past two decades. These unsightly growths of bottom-dwelling algae may be due in part to the failure of septic tank drain fields to remove algal nutrients. A large increase in the standing crop of "slime" algae and rooted aquatic plants, which commonly accompanies eutrophication, may interfere with boating and swimming, cause reductions in life-giving dissolved oxygen, and interfere with fish spawning.

The Flathead Lake drainage is the last major refuge in Montana for large bull trout and westslope cutthroat trout, both highly prized native sport fishes and both designated as species of special concern by the Montana Department of Fish, Wildlife and Parks. Adult fish of both species reside in Flathead Lake and migrate up tributary streams to spawn.

Initially, the added fertility might actually stimulate the production of sport fishes in Flathead Lake, but only if the added nutrients are channeled into or "packaged" in the food items these fish prefer. Existing food chains would be upset in the advanced stages of eutrophication. This upset, together with associated water quality degradation, would reduce populations of bull trout, westslope cutthroat trout, and other sensitive species, including the lake trout. Eutrophication would ultimately favor fish like suckers, peamouth, and squawfish, which have less exacting food habits and are more tolerant of degraded water.

The recreational use and water quality preservation values of the Flathead Lake/River ecosystem have been calculated to be worth about $100 million per year. Clear water and a highly prized and self-sustaining native trout fishery are two features that make this resource so valuable. Both will be lost if accelerated eutrophication is allowed to continue unchecked.

The five-year Flathead River Basin Environmental Impact Study, funded by the Environmental Protection Agency and completed in 1983, left no doubt that water quality in the Flathead River Basin is deteriorating at an accelerating rate. In response to public support, the 1983 Montana Legislature established the Flathead Basin Commission to "protect the existing high quality of the Flathead Lake aquatic environment...and the

Fig. 1. Estimated percent of phosphorus from point sources, bulk precipitation, and non-point sources that is bioactive and of cultural origin.

Source	Percent Bioactive	Percent of Cultural Origin
Point Sources	100	100
Bulk Precipitation	80	30(?)
Non-point Sources	5-20*	1-10*

*A small but unknown fraction of the total non-point phosphorus load, represented by domestic wastewater from households on individual sewage treatment systems, is essentially all bioactive and of cultural origin.

natural resources and environment of the Flathead Basin." The commission is comprised of representatives from federal, state, local, and tribal agencies, as well as private interests. Among other recent accomplishments, the commission successfully lobbied the 1985 Legislature to pass a bill allowing local governments to restrict sale and distribution of phosphorus-containing detergents.

Phosphorus is the nutrient that controls algae growth and the rate of eutrophication in Flathead Lake. Phosphorus is common in igneous rocks and sediments, in precipitation, in human and animal wastes, and in many laundry detergents. Only in its soluble, inorganic form (phosphate) is phosphorus "bioactive," that is, biologically available to algae and capable of stimulating algal growth. Some sources are much richer in bioactive phosphorus than others. Each additional unit of bioactive phosphorus is capable of generating about 500 times its weight in algae.

Much of what is known about the sources and biological availability of phosphorus in the Flathead Basin is the result of research and monitoring conducted by the UM Biological Station at Yellow Bay. This work is continuing under cooperative funding from many contributors, and interpretations of the lake's status are updated annually.

Major sources of phosphorus in the Flathead Basin are: (1) point sources, (2) bulk precipitation, and (3) non-point sources (Fig. 2). Point sources—effluents from community wastewater treatment plants—account for about 10% of the total annual phosphorus load to Flathead Lake. Another 15% of the total load falls on the lake as rain, snow, smoke, pollen, and dust. The remaining 75% of the phosphorus entering Flathead Lake comes from non-point sources, including overland runoff from developed and undeveloped lands, natural and accelerated stream bank erosion, and recharge of surface water by groundwater, some of which has been contaminated by septic tank drain fields.

Only a fraction of the phosphorus that enters Flathead Lake is bioactive. This fraction varies depending on the source (Fig. 1). Very little of the phosphorus from runoff and erosion (5% to 20%) is bioactive, but virtually all of the phosphorus in domestic wastewater and most of the phosphorus in precipitation is capable of promoting the growth of algae.

At least 25% of the phosphorus in domestic wastewater comes from laundry detergents. About half the population in the Flathead Basin has sewers and is served by central wastewater treatment systems; the other half is on individual septic tanks and drain fields. Almost all of the detergent phosphorus from those with sewers gets into Flathead Lake. A smaller but unknown amount of detergent and other phosphorus generated by those without sewers finds its way into Flathead Lake and into other lakes in the basin.

Agricultural and forest practices, urban runoff, and septic tanks and drain fields have been suspected as the most important cultural (man-caused) non-point sources of phosphorus in the Flathead Basin. Recent studies have demonstrated just how important some of these sources are.

Research on the Stillwater River, conducted by the Biological Station, suggests that agricultural practices in the upper Flathead Valley generate less than 1% of the biologically available phosphorus entering Flathead Lake. Similarly, the increase in sediment and phosphorus in Flathead Lake from forest practices is probably quite small, but opening the forest canopy by logging may increase water yield and channel erosion in streams tributary to the lake. A study conducted by the Flathead Drainage 208 Project found that phosphorus in Kalispell's storm water runoff was only about 2% of the phosphorus measured in that city's wastewater effluent.

On the other hand, communities without sewers, subdivisions, and individual households may add considerable amounts of phosphorus to local groundwater. If drain fields are set too close to lakes or streams, if they are not properly maintained, or if they are placed in soils having inferior phosphorus-filtering properties, contamination of surface waters will result. This phosphorus is essentially all bioactive and can be harmful to the lakeshore.

Lakewide, the vast majority of phosphorus reaching Flathead Lake is from non-point sources. Probably more than 90% of this phosphorus is

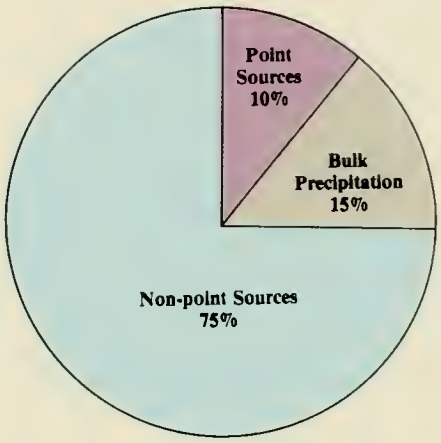


Fig. 2. Estimated percent of the total annual phosphorus load to Flathead Lake contributed by point sources, bulk precipitation, and non-point sources of phosphorus.

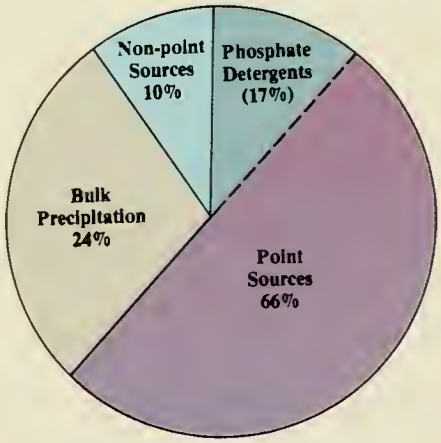


Fig. 3 Estimated percent of the man-caused, biologically available phosphorus load to Flathead Lake contributed by point sources, bulk precipitation, and non-point sources of phosphorus. The contribution from non-point sources is slightly underestimated for the reasons stated in the footnote to Fig 1.

natural, background phosphorus. Conversely, a very small percentage (less than 10%) of the total non-point phosphorus load that reaches Flathead Lake is cultural, resulting from land disturbance and on-site disposal (Fig. 1). And, except for phosphorus from households, only a small fraction of that phosphorus can be used by algae.

When the cultural origin and bioactive potential of phosphorus sources are taken into account, the phosphorus in effluents from community wastewater treatment plants (including detergent phosphorus) is recognized as a very large pollution source (Fig. 3).

Flathead Lake probably had changed little since the last big valley glacier retreated 10,000 years ago; but now the lake is changing before our eyes.

In April 1984, the Montana Department of Health and Environmental Sciences (MDHES) prepared a "Strategy for Limiting Phosphorus in Flathead Lake." The "Strategy" outlined a six-point plan to reduce phosphorus inputs to the lake:

(1) Impose phosphorus limits on all state-permitted effluents in the basin.

(2) Develop wastewater management plans for communities without sewers in the basin.

(3) Recommend legislation to allow sale of only low-phosphorus or phosphorus-free laundry detergents.

(4) Strengthen the control of non-point sources of phosphorus.

(5) Require subdividers to evaluate the phosphorus-filtering capacity of soils where drain fields would be sited near surface water.

(6) Expand and refine the phosphorus monitoring program in the basin.

This approach does not single out any one source of phosphorus, but applies controls to all controllable sources. Not only is this approach equitable and fair, but also scientists are convinced it is necessary to make any headway against accelerating eutrophication.

After two years, there is some real progress to report in all six areas of the "Strategy":

(1) Phosphorus limits have been placed on treated wastewater effluents discharged by the communities of Big Fork, Columbia Falls, Kalispell, and Whitefish, and compliance schedules have been approved for each community. The federally funded construction grants program will help pay the cost of necessary improvements to wastewater treatment plants. (The treatment plants at Hungry Horse Dam and at the UM Biological Station, which serves Yellow Bay State Park, are already meeting their phosphorus limits.)

(2) Progress is being made toward eliminating local water quality problems at Lakeside and in the Whitefish County Water and Sewer District surrounding Whitefish Lake.

(3) The 1985 Legislature passed HB 711 which allows counties to adopt an ordinance to restrict distribution and sale of certain phosphorus-containing detergents. Implementation of such an ordinance will reduce the amount of phosphorus entering municipal wastewater treatment plants, reduce treatment costs, and, more important, reduce the amount of phosphorus that originates from the other half of the basin's population that uses on-site sewage disposal.

(4) The Flathead National Forest has completed a 10-year Forest Plan and Draft Environmental Impact Statement that addresses the water implications of resource management alternatives. Region One of the U.S. Forest Service, which includes the Flathead National Forest, is strengthening its management practices to protect water quality.

(5) In December 1984, the Montana Water Quality Standards were amended to allow closer review by the MDHES of sewage systems in subdivisions that might be impacting lakes and streams. If necessary, the state may impose additional treatment to curtail the off-site transport of phosphorus.

(6) The Flathead Basin Commission has coordinated design and funding of a comprehensive monitoring plan. Approximately $86,000 per year has been committed from a variety of government and private sources to continue phosphorus and related water quality monitoring in the basin.

Controlling phosphorus inputs to Flathead Lake will help, but phosphorus is not the only factor that regulates algae growth and the lake's trophic status. Flathead Lake is a complex ecosystem that responds to a myriad of physical and biological influences. Manipulation of the lake level by Kerr Dam and releases from Hungry Horse Dam upstream are affecting the ecology of Flathead Lake in ways that scientists are only beginning to understand. Introduced species like yellow perch, kokanee (salmon), and the opossum shrimp (*Mysis relicta*) may be promoting algae blooms by selectively feeding on the small aquatic animals that would ordinarily graze the algae and keep them in check.

We have much to learn about the animate and inanimate components of the Flathead Lake/River ecosystem and how they interact. When we do learn more, perhaps other options will become available for managing the lake and extending its useful life span.

This summer, scientists from both sides of the international boundary will wrap up their assessments of water quality impacts attributable to the proposed Sage Creek Mining Company's open pit coal mine on Cabin Creek—just north of the border in the North Fork of the Flathead River drainage. This effort will culminate nearly two years of work under the auspices of the International Joint Commission to resolve concerns expressed by citizens and by the governments of Montana and the United States regarding the environmental effects of the proposed mine on the Flathead Lake/River ecosystem. Those concerns will be heard much better and recommendations to minimize problems will be taken much more seriously if we in Montana do *our* part to protect Flathead Lake.

And that's the kind of stuff we can believe in, even if we are no longer 8 years old. ■

READERS RESPOND

The Two-Ton Nest

I just finished reading the May/June 1986 issue of your magazine and, as usual, greatly enjoyed the articles. After living in Montana for several years and visiting some of the places mentioned, it's always nice to remember.

This fall I will be taking part in the big game season and will spend some time in Montana. One part of "Up, Up and Away—Montana's Soaring Eagles" caught my eye and really amazed me. On page 4, it mentioned an eagle needs a clear flight path to its nest to accommodate its eight-foot wing span; it also states that sturdy horizontal limbs are necessary to support the bulky eagle nest which may weigh up to *two tons!*

When I am in Montana this fall, I was wondering if one of your staff might take time to show me this tremendous piece of eagle know-how. I would be greatly interested in seeing the nest, but that would be minor if I could get a glimpse of the bird that built it!

It *is* a typing error, isn't it?—*Kent Schaub; Ness City, Kan.*

• *It's no surprise that some eagle-eyed reader raised a question about the "two-ton nest." Even the* Montana Outdoors *staff was a little incredulous, so we are prepared to stand behind (not beneath) our statement.*

Bald eagles traditionally return to the same nest site year after year. Even if one adult dies, the other will return and attempt to attract another mate. This nest site fidelity is responsible for long-term traditional use of nesting territories.

Each year, nesting material is gathered by the eagles and added to the nest. Sticks and branches used in nest construction are generally from one to three inches thick, and from two to five feet long. Grass, bark, needles, and twigs are used to line the nest, forming a uniform mat to hold the eggs. In a sense, bald eagles build each year's nest on top of the previous one.

In Montana, one nest was known to be occupied from 1938-82, 44 years. That nest actually measured 6-1/2 feet in diameter and was 12 feet deep. The volume of a cylinder with those measurements is:

$v = \pi r^2 h$

$= (3.14)(3.25 \text{ ft.})^2(12 \text{ ft.})$

$= 397.995 \text{ ft.}^3$

The eagle nest was not a perfect cylinder because it tapered near the bottom. We estimated the nest volume as 75% of the cylinder volume, or:

$(397.995 \text{ ft.}^3)x(.75) = 298.49625 \text{ ft.}^3$

Careful research reveals that a cord of air-dried ponderosa pine weighs 1,904 pounds and has a volume of 128 ft.^{3} *Therefore, this super nest should weigh about 4,440.1317 pounds.*

Bald eagle nests often contain branches of Douglas-fir, western larch, or other species heavier than ponderosa pine. Nests also absorb a great deal of rainwater and snowmelt, which increases their weight. On the other hand, the surface to volume ratio of sticks is higher than for cordwood and this consideration would reduce the weight. We have assumed these factors cancel one another.

We acknowledge the fact that this particular nest is exceptionally large. Typical bald eagle nests in the Northwest are about three feet deep and five feet in diameter. That's why we said that a nest "...may weigh up to two tons."

No, Mr. Schaub, it wasn't a typing error.—Dennis Flath, Rob Hazlewood, co-authors.

World Record?

This is just a short note to say I found John Fraley's mountain whitefish article, "It Don't Get No Respect," very interesting and informative.

As an aside, however, the world record is not the 5-pound, 2-ounce Washington mountain whitefish he referred to (see page 28 of the March/April 1986 issue of *Montana Outdoors).* While I'm not sure what the world record is, the Alberta record is 5-pounds, 4 ounces. There are some very big mountain whitefish in Alberta.

Congratulations on yet another great issue of *MO.* I find your magazine terrific.—*Duane S. Radford, Southern Region director, Fish and Wildlife Division, Alberta Department of Energy and Natural Resources; Lethbridge, Alta.*

• *Our source for the 5-pound, 2-ounce record was the "1986 World Record Game Fishes," "All-Tackle" category (page 154), published by the International Game Fish Association (IGFA). To apply for a world record, the angler must submit a completed IGFA application form. Perhaps your Alberta prize would be eligible; if accepted, it would be a new record.*—Ed.

Upwind or Downwind?

On page 11 of the May/June 1986 "The Catchall," in the article about grizzly bears, your magazine stated: "Slowly detour, keeping upwind so it will not get your scent...." I hope you meant "downwind." I would certainly not want to be upwind of a grizzly bear. I would rather smell a grizzly upwind rather than have him get a whiff of me.

My wife and I moved from Montana three years ago and still have fond memories of high-country fishing and backpacking, particularly in the Spanish Lakes area. You put out an excellent magazine; keep it up.—*Robert L. Godfrey; Cashmere, Wash.*

• *Thanks for calling this matter to our attention. The complete passage read: "Give the bear plenty of room. Slowly detour, keeping upwind so it will not get your scent and know you are there." It* should *have read: "Give the bear plenty of room. Slowly detour, keeping upwind so it will get your scent and know you are there." Although it's a judgment call, most experts believe you will be safer if the bear is alerted to your presence so that it has ample time to move away. Most bears prefer to avoid contact with man.*—Ed.

Enlightened Economics

Congratulations to Patrick Graham for his progressive and far-sighted thoughts on economic quantification of the wildland experience, and to *Montana Outdoors* for publishing them (March/April 1986). This is the kind of thinking that must become the norm rather than remaining the exception among land use planners, industrialists, politicians, and the general public if we are to have any hope of preserving America's surviving wildlands, not just from one legislative and courtroom battle to another, but for eternity.

In a time of ever intensifying land use conflicts, when large segments of these groups of people are still (I hope not hopelessly) enmeshed in traditional economic theories that assign no value to land other than direct commercial dollar return, Mr. Graham and *MO* are performing a fine service indeed in presenting a far more enlightened philosophy of wildland valuation. The value of preserving wildland for clean air and water production, for fish and wildlife, for its scenic qualities, opportunities for recreation and solitude, and simply for its own sake, must never be underestimated.—*Eric Gellert; Bothell, Wash.*

The Joy of Backpacking

continued from page 6

country camp provides some of the greatest pleasure of the backpacking experience.

First, try to find a level, well-drained area likely to be secluded from other campers. Pick a spot that's been used before to avoid further damage to the land, and camp at least 100 feet from water sources.

Cook with a backpack stove if possible. If you build a fire and you see existing fire rings, use them. When you leave, you can improve a site by breaking apart old fire rings and eliminating

VERN CRAIG

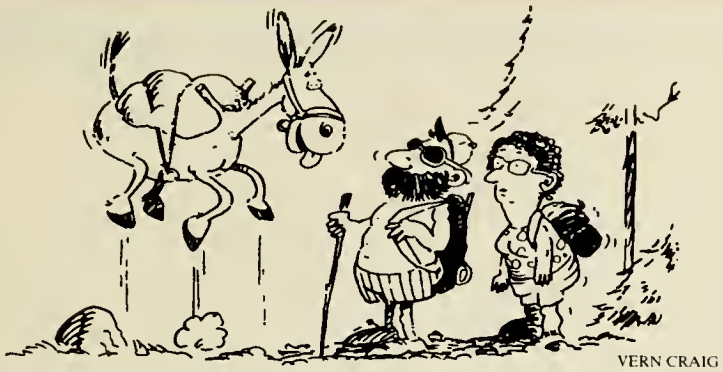
as much physical damage to the land as possible. If there is little evidence of use, build a "no trace" fire on a flat rock, on bare soil, or in a shallow pit. When you are ready to leave, scatter the cold ashes and make the site look like it did before you used it—or even better. Always gather dead wood from the ground rather than breaking it from trees. Don't contribute to the "human browse lines" around many of the more heavily used backcountry lakes and campsites.

Wilderness ranger Gordon Ash of the U.S. Forest Service stresses the following points for "low impact" camping: "Bury human waste in the organic soil layer, at least 200 feet from water sources. Don't cut live boughs or green trees—leave your ax at home. And always remove pieces of aluminum foil from your fire ashes."

Be safe—hang your food and gar-

HIKING TRAILS IN MONTANA'S NATIONAL FORESTS

NATIONAL FOREST	TRAIL MILES		WILDERNESS AREAS
	Wilderness	Non-Wilderness	
BEAVERHEAD NATIONAL FOREST P.O. Box 1258 Dillon, MT 59725 (406) 683-2312	254	1,333	Anaconda-Pintlar Lee Metcalf
BITTERROOT NATIONAL FOREST 316 N. Third Street Hamilton, MT 59840 (406) 363-3131	950	648	Anaconda-Pintlar Selway-Bitterroot
CUSTER NATIONAL FOREST P.O. Box 2556 Billings, MT 59103 (406) 657-6361	170	142	Absaroka-Beartooth
DEERLODGE NATIONAL FOREST P.O. Box 400 Butte, MT 59703 (406) 723-6561	96	592	Anaconda-Pintlar
FLATHEAD NATIONAL FOREST P.O. Box 147 Kalispell, MT 59903 (406) 755-5401	1,174	943	Mission Mountains Bob Marshall Great Bear
GALLATIN NATIONAL FOREST P.O. Box 130 Bozeman, MT 59715 (406) 587-5271 ext. 4233	614	1,239	Absaroka-Beartooth Lee Metcalf
HELENA NATIONAL FOREST Drawer 10014 Helena, MT 59626 (406) 449-5201	118	546	Gates of the Mountains Scapegoat
KOOTENAI NATIONAL FOREST P.O. Box AS Libby, MT 59923 (406) 293-6211	99	1,084	Cabinet Mountains
LEWIS & CLARK NATIONAL FOREST P.O. Box 871 Great Falls, MT 59403 (406) 727-0901	460	1,231	Bob Marshall Scapegoat
LOLO NATIONAL FOREST Building 24, Fort Missoula Missoula, MT 59801 (406) 251-5325) (406) 251-5325	182	1,641	Rattlesnake Scapegoat Selway-Bitterroot Welcome Creek
TOTALS	4,117	9,399	
	(Total 13,516)		



THE INDISPENSABLE DOZEN

Don't leave home without the following essentials: first aid kit, waterproof matches (fire sticks), flashlight (extra bulb, batteries), bug repellent, light rain gear, topographic map, compass, candles, emergency food kit, emergency extra clothes, water bottle, pocket knife.

bage in plastic bags about 10 feet above the ground, some distance downwind of your cooking area. It's best to pitch your tent 100 feet or more upwind of your cook site, and keep your tent area free of food odors. Don't place your tent near a well-used game trail.

Camp in small groups. I've seen some heavy damage at backcountry sites caused by large groups of campers. On one trip, I saw a group of 16 people with 17 horses camping at several areas over one week. These inconsiderate wilderness users left such a trail of destruction on the natural vegetation that we called them "the locusts." Make sure you camp in such a way that others will not be able to tell you were there. As the saying goes: "Leave only footprints; take only memories."

Now that you're settled in camp, it's time to set up your wilderness kitchen. You've heard people say that everything tastes great in the mountains—it's true. You don't have to do anything fancy to please yourself and impress your friends with your culinary abilities.

Cooking on a stove is very simple. Bring foods which require little preparation time, such as minute rice, macaroni dinners (excellent when supplemented with a can of tuna), powdered soups, or freeze-dried dinners. You can prepare these meals quickly and easily, freeing more of your time for other activities.

Cooking over a fire requires a little more patience and effort, but on the other hand offers more possibilities. You can bake various dishes in aluminum foil. Trout are excellent prepared in foil with lemon and onion slices. Bake biscuits or cook potatoes in foil over low coals. You can even barbecue chicken or steaks if you wish, but avoid these foods in bear country.

Supplement meals with other foods found at the grocery store. Instant cheesecake and pudding are easy to make and are especially good with fresh huckleberries. You can choose from a variety of hot and cold drink mixes, and there is almost an unlimited variety of snacks. Be creative, and I think you'll find that backcountry cooking can be one of the most rewarding parts of your trip.

Other Backcountry Activities

The backcountry offers some of the best opportunities for fishing, photography, hunting, skiing, and viewing nature. Backpacking enables you to set up a base camp from which to enjoy these diversions.

Trout are usually easy to catch in remote areas. They haven't seen many hooks, and they will often strike at almost anything reasonably presented by the angler. Fly-fishing is one of the most effective ways to catch mountain trout, but if you are a beginning fisherman, brush and trees may make it nearly impossible to cast far enough to reach feeding fish. Because of this, you might consider using a lightweight spinning outfit with lures, or by casting a bubble and fly. You can cast the torpedo-shaped bubble a long way without worrying about brush interfering with a backcast. It's best to tie several flies on three-foot-length leaders behind the bubble.

Almost any fly in sizes 10 to 16 will catch feeding trout in mountain lakes and streams. Some of my favorite backcountry flies are the brown hackle peacock, Royal Wulff, mosquito, ant, Joe's hopper, and Adams. Most sporting goods stores and fly shops carry these patterns.

You can catch high country trout on a variety of live baits. Grasshoppers are effective and are usually easy to catch in summer. Aquatic nymphs or larvae found under rocks along the water's edge will usually work. You can also use good old garden worms or night crawlers. If you are resourceful and persistent, you should be able to catch a few trout for dinner in most mountain lakes and streams. Never keep more fish than you plan to eat for your next meal. Be sure to check with the Forest Service or Montana Department of Fish, Wildlife and Parks for information about the area you plan to fish.

Photography is another activity unsurpassed in the backcountry. Wildflowers abound, and you won't have to worry about roads, fences, or telephone wires showing up in your frame. Wilderness wildlife photography is becoming more popular because it shows animals in their natural setting. Best of all, you will be able to photograph that lake, stream, or peak as the sun rises and sets.

Some of my most enjoyable hunting experiences have been from a backpack base camp. Again, you are in the heart of the wild country at daybreak and in the evening, which are the times that wildlife is most active. I've also enjoyed extended cross-country ski backpack trips. This activity seems to be growing in popularity each year (see "'Fourth Season' Campout," *Montana Outdoors,* Nov./Dec. 1985.).

Happy Trails

Why go backpacking?

Bob Marshall, the great wilderness pioneer, wrote: "The enjoyment of solitude, complete independence and the beauty of undefiled panoramas is absolutely essential to happiness."

In the final analysis, the rewards of backpacking really can't be described—they can only be experienced. So what are you waiting for? Lift that pack, head for the backcountry, and find out for yourself. I'll see you along the trail. ■

CONTRIBUTORS

• Where to go. How to prepare, plan, and pack. What to expect along the trail. Backcountry camping tips. Other enjoyable backcountry activities. "The Indispensable Dozen"—items you shouldn't leave home without. Follow **John Fraley's** advice, and you, too, can experience "The Joy of Backpacking." His article begins on page 2. Fraley is special projects manager for the Department of Fish, Wildlife and Parks in Kalispell. He would like to thank Gordon Ash and the U.S. Forest Service for assistance with this article.

• The all-too-true humor in **Vern Craig's** cartoons is not seen frequently enough in our pages. Now retired from the department, Craig spends his time acquiring graphics packages for his computer, and working hard to justify his title of "Ace Computer Wizard."

• "Operation Trophy Kill" has a pretty sobering subject: the illegal killing, smuggling, and selling of just about any wildlife species with monetary value. It was a three-year undercover investigation, and its successful conclusion resulted in 46 convictions and the largest prison sentences ever handed down in a wildlife case. It was a cooperative effort between state and federal law enforcement groups—and **Randy Smith's** article on page 7 is a fascinating peek at how an undercover operation works. Smith participated in the undercover operation and was present on the October morning in 1984 when the arrests were made. He is a warden sergeant with the department's Law Enforcement Division in Missoula.

• This is the first time **Diana Haker's** work has appeared in *Montana Outdoors.* As a teacher in Worden, Mont., she has used her illustrations to present wildlife to her elementary grade school students. Her work has appeared in *Bugle,* the publication of the Rocky Mountain Elk Foundation, and in *Safari,* Safari Club International's magazine.

• Spring Meadow Lake State Recreation Area near the west edge of Helena is "A Park Made Visible." In the late 1920s, this site was a gravel pit. The excavation formed a deep hole, which soon filled with water from underground springs. The gravel operation closed in the mid-1960s, and, with time, a lake was born. **Paul Pacini** is a planner in the Parks Division. Turn to his article on page 15.

• In 1983, Flathead Lake had its first lakewide bloom of blue-green algae. In that same year, a study funded by the Environmental Protection Agency left no doubt that water quality in the Flathead River Basin was deteriorating at an accelerating rate. One of the positive steps that resulted was legislation to allow local governments to restrict sale and distribution of phosphorus-containing detergents. To learn more about "Flathead Lake's Midlife Crisis" and a strategy to reduce phosphorus input to the lake, turn to **Loren L. Bahls'** article on page 18. Bahls is supervisor of the Water Quality Management Section for the Department of Health and Environmental Sciences. He is also U.S. co-chairman of the Biological Resources Committee, Flathead River International Study Board, International Joint Commission.

• Another first for *MO* is the Flathead Lake illustration by Missoula artist **Monte Dolack.** The original piece was commissioned by Ernie Ratzburg, Polson. Dolack's posters cover subjects from Bogart and Bacall ("Crystal Theatre") to several species of ducks resting in a bathroom ("Suburban Refuge"). His vibrant colors, mastery of detail, and unique personal style have enabled him to produce a body of work that has received national and international recognition. A native Montanan, Dolack emphasizes, "You can't help but see the powerful influence of the natural environment in Montana—the nearby wildernesses that harbor endangered species, the secret trout streams, the sweep of the western landscape." Many of the images in his posters underscore his commitment to preservation of this natural world. For information about "Flathead Lake" and other Dolack posters, contact: Monte Dolack Graphics, P.O. Box 8927; Missoula, MT 59807 (406/549-3248).

• It's hard to know what verbs to use: It lives/lived in a canyon downstream from Kootenai Falls. It could be/is the first native fish species to become extinct in Montana. The uncertainty arises over the white sturgeon, North America's largest freshwater game fish. It is plentiful in other parts of its range, but what may have been/is Montana's last sturgeon was seen by underwater biologists in 1979. As **Patrick Graham** writes in "Out of the Darkness," "For a creature to survive for 400 million years and then to pass from the scene within my lifetime has caused me to want to look even more deeply into that darkness." Graham is the Fisheries Division's chief of management, and his article begins on page 27.

• Among the "Farm Bill Facts" are these: From a conservation perspective, this is one of the most important pieces of legislation enacted in many years. The best part is that it offers some solutions to soil erosion, one of which is the federal government sharing 50% of the cost of establishing permanent vegetative cover on land accepted into a Conservation Reserve Program. For an explanation, turn to **Bob Martinka's** article on page 30. Martinka is the department's coordinator of Farm Bill activities.

• Butte artist **Diane Nugent** prepared the pen and ink especially for Martinka's article. She does pastel portraits and accepts commissions for pen and inks and watercolors of homes and businesses. Contact her at her studio: 1560 W. Granite; Butte, MT 59701.

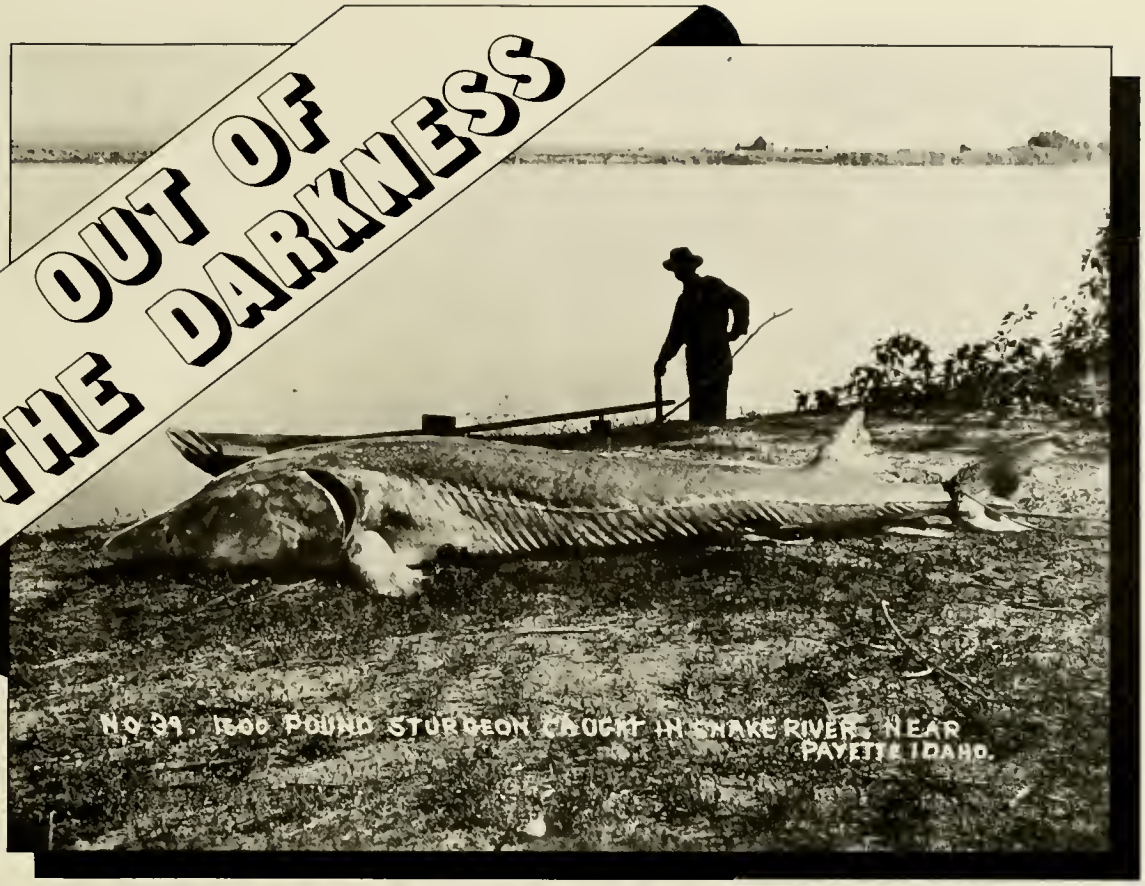
• C-O-R-E is "Hard C-O-R-E" (Conservation and Outdoor Recreation Education). It's also an 18-credit course that begins on the University of Montana campus and moves to a Forest Service dormitory near Condon. It's more than just a quarter of "book learnin'"; it's teamwork, cooperation, and plain, old-fashioned work. One of the instructors is **Joel Meier,** who wrote the article for this issue (page 33). Meier is professor of recreation management in UM's School of Forestry. The article is accompanied by "Reflections" from some of this year's C-O-R-E students.

• "Fatso" was about as big around as he was long. And "Fussy" was particular, so she had to be coaxed. "Fatso and Fussy" play leading roles in this issue's "Perspective" by **Pat Barnes.** These two were the first in a long line of Barnes' happy memories of fish caught and released. Turn to his humor, with a lesson for all who fish, on page 36. Barnes lives in Helena and is a retired teacher. He worked for the Forest Service in the summers, guided fishermen out of West Yellowstone, and operated a tackle shop. He has chased "Fatso and Fussy" and their relatives in India, England, Ireland, Tasmania and New Zealand.

• There's lots fishy in **Harvey Eckert's** watercolor, but that's as it should be. Eckert, who lives in Butte, is well-known for his accurate, colorful, and true-to-form fishing art. He is a full-time freelancer, and his work has appeared in many fishing publications. For additional information about his work, contact him at 4041 Paxson; Butte, MT 59701 (406/494-6021).

• Special thanks to the following photographers: **Diane Ensign,** Whitefish; **Bert Lindler,** Great Falls; and **Mike Logan,** Helena.

OUT OF THE DARKNESS



Oregon Historical Society photo (WESLEY ANDREWS)

by Patrick Graham

As we edged down the watery canyon wall, the light from above diffused. No longer could we make out the surface of the river. We clung to boulders—"elephant rocks" we used to call them—as schools of trout glided in and out of view.

Slowly we moved deeper, checking our gauges as we went. At 50 feet, we could make out the river bottom. We could also trace the twisting tracks of the river on the rock walls.

We began to swim upriver against the current, a light in one hand, a rope in the other. We could see maybe 10 feet ahead of us, so the white safety rope was the only link between my partner and me. As we moved into the narrow parts of the canyon, one of us would occasionally lose his grip and be swept against one of the elephant rocks.

We were now swimming more than 80 feet below the surface of the Kootenai River in a long, narrow canyon downstream from Kootenai Falls. Four thousand cubic feet of water per second was flowing between the canyon walls.

On the river's bottom, the current had washed the gravel clean, and the fish were far fewer. Who knows what they must have thought as masked divers with orange tanks and flippers swam into view. I know what I would have thought if something 10 times my size had poked its masked head out of the darkness.

Joining my partner and me were four other volunteer divers from Kalispell and Libby. We had spread out, searching for a creature at home in this canyon. In fact, this was the only place in Montana you could find him. We were seeking a white sturgeon, the largest freshwater game fish in North America. To many people, his prehistoric shape was reminiscent of something other than a fish. With a pointed snout, a protruding mouth, large armorlike scutes, and an arching tail, the white sturgeon might cause an unknowing angler to reach for his pocket knife to cut his line.

In the late 1940s and '50s, fishermen frequently reported catching sturgeon in the Kootenai River near Troy, Mont., while fishing for ling on set lines. In the late '50s and early '60s, the ling population went downhill rapidly. This coincided with increased algae growth due to water pollution in the late 1950s. The catch of sturgeon also began to decline, according to reports by local fishermen. It is not clear whether the decline in catch was due to fewer sturgeon or fewer ling fishermen.

In the early 1970s, a group of fishermen from Libby began keeping records of the white sturgeon they caught in the Kootenai River. Herb Stout of Kalispell was one of those fishermen, and in 1968 he caught what became the state record at 96 pounds. Other interested fishermen, led by Vick Applegate, now of Missoula, worked to convince the Department of Fish and Game (now the Department of Fish, Wildlife and Parks) to classify the white sturgeon a game fish, as it was throughout the rest of its range. This classification would allow the department to regulate the harvest of white sturgeon. In the early '70s, the Montana Legislature adopted the department's recommendation to do just that.

The white sturgeon was previously not recognized as a game fish in Mon-

tana partly because of its narrow range: It is found only in the Kootenai River downstream from Kootenai Falls. Also, it had not been recognized as a game fish because so little was known about this freshwater giant.

White sturgeon are anadromous in many parts of their range, which is limited to the Pacific shores of North America, from the Aleutian Islands of Alaska to Monterey, Calif. Anadromous fish are born in fresh water, migrate to the ocean where they grow to maturity, and then return to fresh water to spawn. However, white sturgeon in the Kootenai River have been landlocked for at least 10,000 years. They have migrated from Kootenay Lake, British Columbia, through Idaho and into Montana.

Herb Stout, Kalispell, is shown with his record white sturgeon. At 96 pounds, Stout's record has stood since July 1968—and it may stand forever. The season on the big sturgeons was closed in 1979, and it may no longer swim in Montana waters. Stout caught his 75-inch record in the Kootenai River, in the canyon below Kootenai Falls, on a gob of night crawlers.

Sturgeon were once an important food source to the Lower Kutenai Indians. Sturgeon, or "wiyal," as the Kutenais called them, were taken in the fall, according to a 1941 ethnograph written by Harry Turney-High. They were great and powerful fish, taken by still fishing in quiet waters by only the most skilled fishermen. The fishermen anchored a set line of heavy rope to a tree on one bank. To the rope they then attached a series of drop lines with bone cross-hooks. They tied a large rock sinker to the other end. When checking the line, one fisherman gently pulled from shore to avoid causing the sturgeon to plunge. As it neared the surface, the other fisherman would spear the sturgeon. When the fishermen returned to camp, the tribe's fish chief directed distribution of the sturgeon flesh among the tribal members.

European settlers began to fish for sturgeon in the Columbia River, although sturgeon were never as important as salmon. During the 1800s, however, an important commercial fishery developed. Unfortunately, fishermen overexploited the sturgeon. Harvest decreased from 5.5 million pounds in 1892, to 73,000 pounds in 1899.

Sturgeon are a long-lived fish, very vulnerable to overexploitation and major habitat changes. The largest white sturgeon ever caught was purported to weigh 1,800 pounds and was caught in the Fraser River in British Columbia in 1897. A 900-pound, 11½-foot-long white sturgeon caught in the Columbia River in 1951 was 82 years old and contained 150 to 200 pounds of eggs, according to a 1979 article by Jim Galbreath in *Oregon Wildlife.*

In Montana, from 1968 to 1972, records kept by Applegate and his friends showed their catch at 43 white sturgeon. In 1975, department biologists attempted to catch white sturgeon for the first time. They caught and tagged six sturgeon in 1975 and two more in 1976. Five of these were moved 27 miles upstream in the hope of establishing a population in Libby Reservoir which was built in 1972.

Subsequently, two of the sturgeon were caught upstream from the reservoir by Canadian fishermen. Information now indicates sturgeon avoid large reservoirs on the Columbia and Snake rivers, and apparently have avoided Libby Reservoir as well.

The sturgeon population downstream in Kootenay Lake has been estimated as up to several thousand fish, and biologists have seen tagged fish which migrated between Idaho and British Columbia. In Idaho, the population of fish is estimated at 800 to 900 sturgeon, although it is difficult to estimate because of their migratory nature.

Sturgeon do not mature for many years. Males must reach 11 to 22 years of age and females must reach 26 to 34 years of age before they spawn. The number of eggs seems to increase with size of sturgeon. For example, a seven-foot, 10-inch fish had 70,000 eggs, compared with 3 million to 4 million in larger females.

White sturgeon are opportunistic, bottom feeders. The young eat small aquatic insects, clams and crayfish. Larger sturgeon also eat fish. Sensory barbels under the snout and in front of the mouth help them locate food, and when they find it, a protrudable, mouthlike vacuum tube enables them to "suck" it in.

During 1978, the last year of intensive study, we fished for sturgeon on set lines and with gill nets. We used frozen squid on our set lines and fished them the way the Lower Kutenais did, although we didn't spear them as they surfaced. In fact, we did not even catch any on our set lines. We were more successful with gill nets sunk in 80 to 100

feet of water. We caught three different sturgeon, and I could then see why the Kutenais speared them.

As they neared the water's surface, they pulled with tremendous strength. Two of us struggled to land a sturgeon barely four feet long. Once in the boat, it thrashed around, as we tried to avoid its powerful tail. Unlike its slender cousins in the Missouri River, the shovelnose and pallid sturgeons, the white sturgeon is a stocky, tough-looking fish.

We surgically implanted radio transmitters on all three so we could track them. But when they sounded into deep holes, the signal became too weak to hear. We captured each of the three sturgeon at least twice during the summer and fall of 1978, but no others, and our concern began to grow.

In 1979, the department recommended and the Fish and Game Commission adopted a closure on fishing for white sturgeon in Montana. That year, we ventured to the bottom of the river on a midsummer day. We had no idea what we would find, possibly young sturgeon too small to catch in our nets, or possibly sturgeon in areas we had not checked before.

Teams of divers went down, returned, and recounted their experiences, but nobody saw a sturgeon. Finally, a team returned with word of a sturgeon, one over three feet long, and possibly another smaller one. Some success, but still disappointing.

The following spring, I got word from Idaho. Two of the three fish we had tagged in 1978 were caught by the same angler within an hour of each other. Spirits sagged still further. We were determined to dive the canyon, and the band of volunteer divers gathered once again. Unlike the sunny days of the previous July, this time a steady, cold rain fell. If we waited for the rain to stop to benefit from the increased visibility provided by the sunlight, we might end up actually losing some visibility because of turbid water. The Corps of Engineers staff cooperated by reducing flows in the canyon, although they were under pressure to keep them up because of the large runoff.

We decided to go. This time the surface disappeared more quickly and the safety rope became an even more important link between partners as we slowly scaled down the watery canyon walls. Visibility was barely five feet, and we hoped the sturgeon could not see any better.

This time Team No. 2 saw a sturgeon. They followed it and saw it several times before it slipped from view into the darkness. The bad news was that it had a tag in its back. Could it be the last of the three sturgeon tagged in 1978? Were there other sturgeon lurking in the darkness?

No one knows for sure. But we do know this: As throughout most of the Columbia Basin, the number of sturgeon in Montana has dwindled dramatically. Untangling the causes for the decline of such a long-lived fish with so little information is like putting together a jigsaw puzzle with pieces from different boxes.

The DFWP developed a recovery plan in 1981. The plan discussed in more detail the potential relationship between the decline in sturgeon and the construction and operation of Libby Dam, as well as historical pollution problems in the river. It called for a more complete assessment of the white sturgeon population and a review of factors that might affect its movement and abundance. The Northwest Power Planning Council adopted measures which directed the Bonneville Power Administration to fund such investigation in Montana, Idaho, and British Columbia.

In preparing a study plan, it became clear how little was known about white sturgeon and how they were affected by hydropower development. Experts from several states and provinces were called together first to identify research needs and then to rank research projects. Few of the projects have begun, and none has been started on the Kootenai River. These projects must compete with many other priorities—mitigation and recovery of other fish and wildlife in the Columbia River Basin.

The DFWP also sought to have the white sturgeon classified as endangered under Montana law. This status can be granted only to native species. The white sturgeon would be the first fish on the list. Purposes of the state law are to provide a means whereby the ecosystem on which an endangered species depends may be preserved, and to provide a program for conservation of the species.

State law has none of the power granted by federal endangered designation. In fact, the designation under state law provides no mechanism for protection not already available to the department. What endangered status *would* do is draw attention to Montanans' concern about the future of the white sturgeon.

The Legislature must adopt by joint resolution such a designation for it to be recognized under the law. The DFWP requested this action in the 1985 Legislature. It almost passed, but was defeated as unsubstantiated fear spread that logging and other industry might be affected.

The fate of the sturgeon in Montana is uncertain. If a solution is sought, it is likely to be slow in coming. A fish that takes 15 or 20 years just to reach maturity does not attract the attention of many scientists or fishermen.

The DFWP is busy managing the many more abundant game fish populations under its charge. There are no plans for additional work on the white sturgeon. Studies funded by the Bonneville Power Administration could provide some clues, but progress has been slow. Transplanting sturgeon was considered by a group of biologists from Montana, Idaho, and British Columbia, but this requires a source of eggs with similar genetic make-up, the expertise to handle them, and a long-term commitment to re-establishing the population.

Some people believe we should be more concerned because the white sturgeon is the first native fish species we may have lost in Montana. And unlike the much maligned snail darter, the white sturgeon is North America's largest freshwater game fish. In areas along the Pacific Coast where they are more abundant, their flesh is served in fine restaurants and their eggs are cultured for caviar.

Others would say the white sturgeon's time has long since passed. We should concern ourselves with the survivors, those species which can continue to provide recreation, such as the rainbow and the kokanee.

My wish? Once again to cling to those elephant rocks in the dark depths of the Kootenai River canyon in hope of glimpsing a prehistoric giant swimming toward me. For a creature to survive for 400 million years and then to pass from the scene within my lifetime has caused me to want to look even more deeply into that darkness. ■

FARM BILL FACTS

by Bob Martinka
illustrated by Diane Nugent

Montana Second in U.S. in Wind Erosion." "Petroleum County Possesses Sodbusting Ordinance." The economic plight of Montana's farmers and ranchers has dominated agricultural headlines lately. But the problem of plowing highly erodible land and the subsequent wind erosion of the soils has been growing for the last decade (see "Sodbusting in Montana: A 1980s Dust Bowl?" *Montana Outdoors*, Sept./Oct. 1983).

Of the 17 million acres of cropland in Montana, an estimated 5 million acres is classified as unsuitable for cultivation or highly erodible. In 1985 alone, over 2 million acres of Montana cropland was significantly damaged by wind. Before damage is reported, erosion rates usually exceed five tons per acre per year. This problem is not unique to Montana, but in 1984, only Texas reported more land damaged.

This problem—the gradual destruction of soils which have developed over thousands of years—has not gone unnoticed by agricultural and conservation groups. Beginning in 1983, a coalition of these groups began working on national legislation to address the sodbusting problem and also to attempt to stabilize and restore damaged areas. The result of their efforts was the Food Security Act of 1985, better known as the 1985 Farm Bill, signed into law by President Ronald Reagan on Dec. 23, 1985. From a conservation perspective, this is one of the most significant pieces of legislation enacted in a number of years.

The bill contains four important conservation provisions. Two of these, the sodbuster and swampbuster sections, are aimed at protecting existing habitat. The other two, the Conservation Reserve Program and the Farm Debt Restructure (or Conservation Easement Provision), are aimed at restoring highly erodible or other farm land types to permanent vegetative cover. The Conservation Reserve Program (CRP) is of the most interest to the Department of Fish, Wildlife and Parks, and we will look at it in greater detail here.

Conservation Reserve Program

The CRP has five major objectives: to (1) remove highly erodible soils from production, (2) improve water quality, (3) control soil erosion, (4) reduce commodity outputs, and (5) improve wildlife habitat. The primary way to achieve these objectives is establishing permanent vegetative cover on qualified lands and maintaining the cover for 10 years.

The Agricultural Stabilization and Conservation Service (ASCS) is the lead agency in implementing the program. Cooperating agencies include the Soil Conservation Service (SCS), the Cooperative Extension Service, and local Soil and Water Conservation Districts. The U.S. Forest Service, U.S. Fish and Wildlife Service (USFWS), and the Montana Department of Fish, Wildlife and Parks (DFWP) will also provide technical advice and information.

Lands eligible for CRP include cropland in Soil Capability Classes V through VIII. (The SCS groups soils into eight capability classes. The risk of soil damage or limitations in use become greater from Class I to Class VIII, along with any land in Classes II through V eroding at three times the tolerance level. The tolerance level [T] is the allowable rate of soil erosion.) The national goal is to enroll 5 million acres in the program this year, and a total of 40 million to 45 million acres by 1990. The Montana goal for the 1986 crop year is 359,400 acres. By 1990, nearly 3 million acres, or about 17% of Montana's total cultivated acreage, could be enrolled in the CRP. These statistics show this program could result in significant beneficial effects for wildlife, especially if the permanent vegetation is established for wildlife.

To enroll in the program, each interested landowner with eligible acreage can submit a bid to the ASCS for the dollar amount (yearly) he thinks he wants or needs per acre to take the land out of production and to establish a permanent vegetative cover. To be eligible, the land must have produced crops in at least two of the past five years. Once the land is in the program, and a permanent vegetative cover is established, no livestock grazing, haying, or other economically useful product may be removed from the land for 10 years. If this agreement is broken, the landowner will be required to pay back all of his annual payments, plus interest, to the government. The maximum payment per year that will be made to any farmer is $50,000.

The first sign-up for the Conservation Reserve Program was March 3-14. Montana landowners showed considerable interest in the program by submitting bids on over 400,000 acres of cropland, most of it in the northeastern portion of the state. Daniels, McCone, Roosevelt, and Valley were the leading counties, with acreage totals ranging from 29,000 to 43,000 acres each. Disappointingly, the Department of Agriculture in Washington, D.C., placed a rather low ceiling on the bids it accepted ($32 to $42 per acre, depending on the productivity of the land). So, only about 15,000 acres was accepted into the program. Nationally, only about 840,000 acres was accepted, far below the 5-million-acre goal. Because of this low acceptance rate, a new sign-up was announced for May 5-23; nearly 118,000 acres was accepted.

The federal government (ASCS) will share 50% of the cost of establishing permanent vegetative cover on land accepted in the CRP. There are nine "eligible practices" for cost-sharing on CRP acreage: (1) establishment of permanent introduced grasses and legumes, (2) establishment of permanent native grasses, (3) tree planting, (4) permanent wildlife habitat, (5) establishment of field windbreaks, (6) diversions, (7) erosion control structures, (8) grass waterways (lowland portions of fields where water normally drains), and (9) shallow water areas for wildlife.

Permanent wildlife habitat, windbreaks, and shallow water areas for wildlife are of particular interest to wildlife enthusiasts. The DFWP is encouraging landowners enrolled in CRP to choose those practices. One possibility is for DFWP to share the landowner's costs of planting and installation of windbreaks and shelterbelts.

Much of the wildlife in central and eastern Montana lives on private agricultural land. Intensified agriculture in the past several decades, first related to export demand and later to unfavorable agricultural economics, has resulted in a decline in wildlife habitat and more frequent wildlife/agricultural conflicts. The CRP provides an opportunity to reverse these trends, especially in upland game bird habitat. In some areas, crop depredation from big game animals could be reduced, and creating shallow water areas could benefit waterfowl as well as many nongame species. This could augment Ducks Unlimited's effort to restore and preserve waterfowl habitat in North America.

National Farm Bill legislation since the mid-1950s has authorized several different types of land retirement pro-

grams. From a wildlife habitat perspective, the Soil Bank program authorized by the Agricultural Act of 1956 was by far the most successful. A portion of the Soil Bank known as the "Conservation Reserve" offered five- or 10-year land retirement contracts, the last of which expired in 1969. Most of the other "set aside" programs available since then have either not been adequately funded or were subject to annual renewal so suitable wildlife habitat did not result.

From 1957 to 1963, between 20 million and 28 million acres of cropland was set aside annually under long-term contracts of the Soil Bank program. These large, long-term land retirement acreages were accompanied by tremendous increases in pheasant populations in the Midwest and northern Great Plains. In South Dakota, pheasant population estimates from 1958 through 1964 were double to quadruple those existing before and after Soil Bank. As a result of the high pheasant numbers, large influxes of nonresident bird hunters provided a shot in the arm for rural economies.

Can today's "Soil Bank" program provide similar results? We certainly hope so, and the prognosis looks good. The goal of the CRP is to have 40 million to 45 million acres enrolled by 1990. This would be nearly 50% more acres than in peak Soil Bank years. SCS specifications for establishment of permanent vegetation are probably more keyed to wildlife now than they were in the 1950s. Since the CRP is aimed at taking highly erosive soils out of production—which was not necessarily the case with the Soil Bank program—long-term soil conservation and water quality should also improve.

Farm Debt Restructure

This provision of the 1985 Farm Bill, also referred to as the Conservation Easement Provision, can assist farmers in weathering these difficult economic times. In essence, this provision provides the U.S Department of Agriculture (USDA) with discretionary authority to offer farmers debt relief in exchange for conservation easements on a portion of their land. However, this is an optional provision of the Farm Bill and at this time we are not sure when it will be implemented. The most recent information indicates this program may be available in Montana by the end of the year.

Although specific implementations and guidelines have not yet been formulated, this provision probably will work as follows:

- The Farmers Home Administration (FmHA) can adjust the terms of a farmer's mortgage in return for conservation easements of 50 years or more on portions of the land least suited to production of commodities. Easements are to be used for conservation (stabilizing soils), recreation (hunting), and fish and wildlife (habitat protection and development).
- The borrower's loan will be adjusted by the portion of the outstanding loan that the acquired easement acreage represents. In no case will the cancelled amount exceed the value of the land on which the easement is acquired.
- Wetlands, uplands, or highly erodible lands may be acquired if the USDA, in consultation with the USFWS, determines they are suitable. Lands, except wetlands, must have been row-cropped in each of the previous three years of record.

Conservation easements would provide opportunities for management by National Wildlife Refuges, state wildlife agencies, municipalities, or conservation groups. Federal or state wildlife agencies, private conservation groups, public works mitigation programs, school community service projects, parks departments, etc. would be responsible for management and enforcement funding. All easements must include public access rights.

Recent newspaper accounts have indicated that more than 600 Montana landowners may be having difficulties making payments on their FmHA real estate loans. Implementation of the Farm Debt Restructure Program could possibly enable these people to hold onto their land. Montana's wildlife and outdoor recreation opportunities might also benefit.

Sodbuster and Swampbuster Provisions

These two provisions are aimed at preventing the plowing of highly erodible soils and protecting existing wetland habitat. They do not involve direct payments to landowners, but require a monitoring program if they are to be successful.

Regulations have not yet been formulated, but here's how they will possibly work:

- These provisions apply to anybody who brought a field into production after Dec. 23, 1985. The land brought into production must be mostly highly erodible, or wetland converted for producing an annual crop. (Wetland is any land with a predominance of hydrophytic [wet] soils that under normal circumstances supports a prevalence of hydrophytic vegetation [growing in water or wet soils]. Highly erodible land is any land classified by the SCS as Class IV, VI, VII, and VIII, or land that if used to produce an annual crop would have an excessive average annual rate of erosion).
- Any producer who converts wetlands or breaks out highly erodible land will be ineligible during the crop year for: (1) commodity price support or production adjustment payments, (2) farm storage facility loans, (3) federal crop insurance, (4) disaster payments, and (5) FmHA loans if the proceeds are to be used to produce a commodity on converted wetlands or highly erodible lands.
- If a person violates the rules, he loses all program benefits for the crop year on *all* farms in which he has an interest.
- Another important aspect of the sodbuster provision is: If a farmer continues to farm highly erodible lands, he becomes ineligible for all of the federal payments mentioned above after the year 1990, *unless* he is operating under a conservation plan approved by the SCS and conservation district.

The 1985 Farm Bill is a complex piece of legislation. The four provisions discussed here are only a small portion of a much larger package. As with most national legislation, considerable controversy surrounds many of the provisions. Some groups don't like any part of the bill; some like a few provisions, but not others. Very few people or groups like the entire package.

This article's purpose is not to pass judgment on the economic and sociological implications of the bill. But it should be obvious that four provisions of the bill have significant conservation implications. They are aimed at reducing a major problem of national significance and proportion—soil erosion. And in proposing a *partial* solution to the problem, some indirect benefits will come about—benefits to wildlife, water quality, and quality of life. It is the department's desire that these programs be adequately funded and properly implemented so that the people of this country, as well as our agricultural economy and heritage, benefit. ■

HARD C-O-R-E

story and photos by
Joel Meier

Would you like to earn a full quarter of academic credit while spending five weeks at a camp between the Mission Mountains and the Bob Marshall Wilderness in Montana's Swan Valley? How about becoming involved in a variety of useful conservation and environmental improvement projects in the Flathead National Forest? Perhaps you're interested in learning firsthand about the dangers of snow avalanches while backcountry skiing and camping high in the Missions. How about learning to lead others in outdoor adventures like mountaineering, rock climbing, winter camping, or whitewater boating?

For the fifth consecutive spring quarter, students enrolled in the University of Montana School of Forestry's Conservation and Outdoor Recreation/Education Program (C-O-R-E) were involved in outdoors experiences like those described above. What is this unique program, and how does it work?

C-O-R-E can best be described as an 18-credit block of academic courses focusing on outdoor recreation leadership development. The holistic and experiential curriculum—combining all aspects of learning—is designed for junior or senior recreation management majors, but students from related disciplines are also allowed to enroll, as space is available. Some students return to the university *just* to take the course. The six recreation management courses comprising the program are: camp leadership, camp administration, outdoor education, organization and leadership of outdoor and wilderness programs, recreation leadership, and current trends in outdoor recreation. One of the unusual aspects of this program is that students take only these classes during the term. They don't have to worry about missing work in other courses while involved in extensive field experiences away from the campus for half of the academic quarter.

The C-O-R-E program focuses on developing outdoor recreation leadership skills. This includes such diverse activities as clearing debris from a stream to reopen habitat for spawning trout, to honing outdoor expedition skills through backcountry travel.

For the first five weeks of the quarter, classes are taught on campus just like regular academic courses. This work helps to prepare students for what is to come later in the quarter. The on-campus lectures cover topics such as expedition behavior, group dynamics, outdoor living skills, outdoor leadership techniques, wilderness ethics, outdoor survival, outdoor

education techniques, camp administration, backcountry travel techniques, menu planning, outdoor recreation programming, wilderness management, and safety/legal liability considerations. Additional discussions cover various kinds of outdoor adventure programs as well as currently controversial subjects, such as outdoor leadership certification. Students also work toward becoming a cooperative and smoothly working team. This becomes crucial later when the group works together toward goal achievement.

Classroom theory is put into use when the program moves off campus for the last five weeks of the quarter. Through a cooperative arrangement with the Flathead National Forest, students and staff live during most of this time at U.S. Forest Service dormitories at the Condon Work Center in the Swan Valley. This experience presents an exciting learning environment, along with an atmosphere where intellectual motivation is encouraged. Students must adjust to rugged conditions while learning to deal with others in a group living/learning environment.

Students learn teamwork and develop a sense of trust through participating in initiative games like "over the wall."

Participation in this part of the program also means long days of hard work. Yet, living on-site in the Flathead National Forest is rewarding because it offers the opportunity to live in a natural setting near some of the most outstanding wilderness and outdoor recreation opportunities in the United States. The opportunity to apply learning theory to the reality of complex outdoor recreation management needs is literally outside the door. Work projects, seminars, interviews, and in-depth discussions with recreation and wildlife management professionals are also part of the schedule. Backcountry ski and camping trips provide a better understanding of outdoor leadership and group dynamics, as well as ecology and the need for wilderness preservation. Living in a

C-O-R-E REFLECTIONS

• *Joel Meier asked the 1986 spring quarter C-O-R-E students for their observations, thoughts, reflections. What follows are excerpts from this recent writing assignment. Because they are sometimes personal, we've included only the student's first name, his or her hometown, and college class. All students are recreation management majors. We think you'll find the comments thought-provoking. And if reading them makes you want to learn more about the course, contact Meier: School of Forestry, Recreation Management, University of Montana; Missoula, MT 59812.* —Ed.

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What comes most to my mind when looking back on the C-O-R-E program is not the work involved, but the beauty that Montana has to offer. The highways and backcountry roads do not do this state's hidden treasures justice. I've lived in Montana for over 10 years, and thought all mountain ranges looked alike. But in reality, each is unique.

Besides the scenery and the outdoors, I learned much about what needs to be done to enhance, to protect, and to create habitat for wildlife. I feel it was a valuable experience.

Pat
Libby, Montana
Senior

This whole quarter has made me more aware of my actions and how they affect other people and/or the environment.

Andy
Friday Harbour, Washington
Junior

*****

I guess I can say I gained something from each work experience, especially if it was really miserable and I went through with it. You find a lot of things in the real world that you don't like to do but you have to.

Lindsey
Westfield, New Jersey
Senior

*****

The material was stimulating. This is my field and I need and want to learn it. I know now that I really do enjoy the biological aspect of my studies.

What was good about C-O-R-E? Many things, especially the experiential aspect. We live, breathe, sleep, and eat what we are doing. I'm glad to have had the opportunity to work closely with so many people and to see resource managers at work.

Randy
Westlake, Ohio
Senior

*****

When our program first started, I was very apprehensive, yet excited, about all the demands placed on us. I wasn't sure if we could handle the load. But after feeling the power of a well-oiled group, I almost felt we could do anything. At this point in the program, I feel excited, but then again sad. I feel excited because I have even more knowledge to share with others and also have made so many good friends. The sad part is that it's almost over and there are friends leaving I may never see again.

In this one quarter at Condon, I've learned more about recreation and more about myself than in all my previous schooling combined. I would enthusiastically recommend the program to everyone, not just to recreation majors.

Richard
Columbia Falls, Montana
Junior

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Our group project, the Blackfoot Whitewater Weekend, was really fascinating to me. Such a big project, which none of us really knew much about, came together so well. It was amazing to see everything fall into place after a lot of hard work. It was good to understand why we were doing what we were doing.

The most positive aspect of the program to me was a definite gain in self-confidence. I felt that I personally gained a lot of skills doing things that many others might have seen as minimal tasks. Overall, I really enjoyed the C-O-R-E program. At

camp environment also aids learning about outdoor recreation leadership and camp administration. In essence, students live and breathe course content, daily and firsthand.

The program involves participation in physically demanding field experiences such as backcountry hiking and skiing, whitewater boating, and rock climbing. Students learn rock climbing techniques of rappelling, belaying, and spotting, while participating in trust exercises, initiative games, and ropes courses. Such exercises develop trust, confidence, and cooperation among members of the group. In addition to being more exposed than usual to weather, participants travel long distances with limited food in mountains at elevations well above 5,000 feet. Extended backpacking trips involve travel by foot and/or on skis in wilderness, with a high percentage of the travel off trail and through very rugged country. As an important part of the program, each individual is challenged to his/her personal limits—both physically and mentally. Nonetheless, neither previous outdoor experience nor physical strength are prerequisites, although arriving in good condition will increase one's ability to enjoy the work and outings. To improve and maintain health, each day at Condon begins with early morning physical exercises, including a group run before breakfast.

While in camp, discussions and lectures continue at various points during the day or evening, but the primary focus is on experiential learning. In addition to the things already mentioned, students, faculty, and staff from the U.S. Forest Service and the Department of Fish, Wildlife and Parks often join the various conservation and outdoor recreation management projects. This field and service work is physically and emotionally demanding for everyone involved.

Generally, each project begins with a lecture or discussion regarding its value or environmental benefits, as well as the safe or proper techniques for doing it. Typical projects might include clipping browse to improve elk and deer habitat, cleaning debris from streams to improve habitat for trout, planting trees to reduce erosion or to improve future wildlife habitat, rebuilding eroded backcountry trails, and cleaning up wilderness campsites. Over time, the C-O-R-E program's volunteer efforts on these and other conservation and environmental projects have saved government agencies literally thousands of dollars, while at the same time providing an outstanding learning experience.

The C-O-R-E program's holistic and experiential nature provides a stimulating and unique way of learning more about both the great out-of-doors and oneself. Whether one is interested in the natural environment or a future career in outdoor recreation, what better way to learn? ■

times, I wished I were somewhere else. But facing problems seemed to make them smaller than they really were.

Julie
Butte, Montana
Junior

*****

I didn't know much about C-O-R-E when I first signed up for it. I knew we were going to go to school half the quarter on campus, then go the rest of the quarter in Condon. I didn't know we had to do a bunch of jobs for the Forest Service, Fish, Wildlife and Parks, fisheries biologists, etc. I thought we were just going to go to class, go up to Condon, and not do much. Boy was I ever wrong!

C-O-R-E turned out to be much more than I thought it was going to be.

It all started in the classroom in the Science Complex, four stories up. I figured something was up when we had to hike up those stairs every morning.

The jobs we did at Condon were a lot of fun. I enjoyed working in the outdoors, getting dirty, and gaining experience with things I didn't know how to do before—creating water bars, cleaning trails, cutting down trees, planting trees. Accomplishing the jobs given to us gave me a sense of achievement of overcoming new challenges. I also like the fact that the whole group came together as one to get the job done fast and efficiently.

It was a great experience, and I'm glad I got to do it. I have some memories that I will never forget and information that will make me a little more knowledgeable than I was before.

Leslie
Woodinville, Washington
Junior

*****

The C-O-R-E program. A few months of learning and growing. Right now as I look back, I have the same feelings I always have after group living; I want to go home. But I also know once I get there, things will change. I'll want to be back here for more timeless time.

I enjoyed the time we spent up north and in Spotted Bear. To me, both of those places brought the solitude that I search for and can only find in places that are still wild. The two trips into the Missions gave me good frame of mind to leave on—to watch people enjoy the purest of beauty in the simplest manner is something that fills my insides up. And for me the ultimate high is to be in the woods where the only pressing things to do are to eat, to sleep, and to move. I love to feel the earth in all her wonder, and I touched that on these trips.

The things I've learned are many—from what bull trout do, to how to organize a race.

I enjoyed myself and the surroundings. I got in touch with myself and am glad I've had the time and opportunity to be here.

Marie
Lincoln, Illinois
Sophomore

*****

Where did the time go? One minute we were packing to get here, the next we're packing up to go home.

I really enjoyed the work experiences. They gave me a chance to do some types of work I've never done before. It was definitely on-the-job training, hands-on experience.

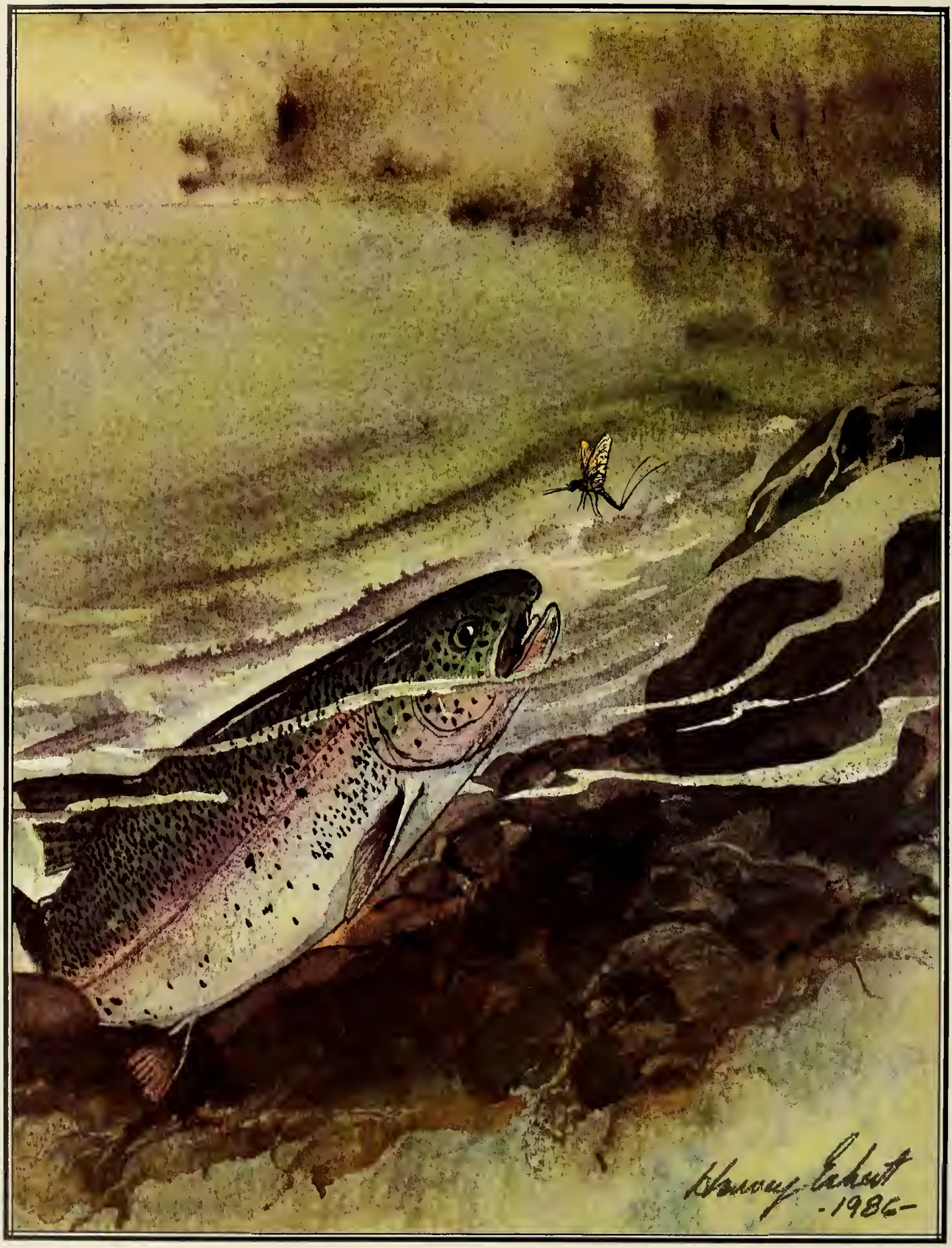
All in all, it was a challenging and rewarding experience.

Coy
Fairfax, Virginia
Senior

*****

C-O-R-E has given me some new insights into Montana. Six months ago, I was planning on leaving this state; now I need to stay. I want to learn more about this state and its natural wonders. I had no conception of Montana before this program, except for Missoula. But after being sandwiched between these two mountain ranges and seeing places like Spotted Bear and Ford Station, I realize my mind has only dabbled in this state.

Lori
Falls Village, Connecticut
Junior


Harvey Ladout
-1986-

"Fatso and Fussy"

by Pat Barnes
illustrated by Harvey Eckert

While I was growing up in the '20s and '30s, our family's favorite sport was fishing. Limits were large, fishermen few. Surplus fish were never a problem. They could be smoked, salted down in kegs, presented to locals who did not fish, or given to the hospital. No one in our town released a fish intentionally.

In the fall of 1937, I went to West Yellowstone, on the upper Madison, to teach school. There, Don Martinez and his young son Stuffy introduced me to the novel notion of releasing fish.

Driving north out of West Yellowstone, past Baker's Hole Campground and beyond the Madison River bridge, I saw Stuffy's bicycle parked on the upstream side of the highway. If you have driven this road, you probably have noticed the willows on both sides of the highway. Before the earthquake of 1959, Hebgen Lake backed up on both sides of the road. The upstream side supported a large population of six- to eight-inch eastern brook trout.

There Stuffy crouched, catching and releasing those scrappy little brookies. While I watched, I noticed a considerably larger fish feeding close to the alluvial sandbank.

"Maybe it would be fun to catch and release that one," I thought.

Later I tried; the fish took, was brought in quickly, and released before I could change my mind. It was a beautiful fish, in spite of a slightly deformed lower jaw. As I watched him scoot away, I dubbed him Fatso because his girth almost equaled his length.

That fall I caught Fatso several times. He was always hungry, feeding from the same mossy cover, not at all choosy as to fly pattern. I considered Fatso my personal friend. When fishing season opened the following spring, I could hardly wait to check on how Fatso had wintered. He hadn't lost any weight and was as gullible as ever.

When school got out, I took a summer job with the Forest Service. They had begun a campground improvement program in Madison Canyon below Hebgen Dam. They wanted to allow campers in established areas, and part of my job was attempting to enforce this policy. The switch from "camp anywhere" to "campgrounds only" met with considerable resistance among perennials who for years had staked out their own campsite in the canyon. The tensions that built from my day's work were relieved by evening fishing.

One of my favorite stretches of the Madison River in the canyon was the area where Beaver Creek entered the river above the Old Beaver Creek Campground. To get to this spot, I crossed Beaver Creek on a log bridge. A large rainbow trout lived in a deep hole above the bridge. Many small fish often fed close to the bridge, but never ventured into the pool above. I could usually catch one of these small trout, but never that larger rainbow, until an old-time summer home resident on the creek suggested I was too impatient.

"Cover 'er with 30 or more good casts with a dry beetle bug, and I think you'll get 'er," was his advice.

Even though his suggestion went counter to my experience and general method of covering water, I followed his advice. The fish finally took on the 41st cast, and since it was his fish in his backyard, I felt duty bound to release it.

It was the largest fish I had released up to this point. It gave me a squeamish feeling, a sense of loss. However, we thought Fussy was a good name for her; she was a one-fly lady and had to be coaxed. That summer Fussy came to a beetle bug several times, never on anything else, and never on fewer than 35 casts.

Those two fish, Fatso and Fussy, were the first in a long line of happy memories of fish caught and released. One of the additional thrills I get out of fishing—besides the simple joy of casting modern equipment accurately enough to get a fish to rise to a fly—is catching a fish I know I have caught before. It is like...well, it is like coming home.

Fatso and Fussy are no longer with us, but several other of my friends are. There are Herman the German and Mr. Big. They were both alive and well, swimming in the Madison River, when I last dropped by for a visit.

How do I know, you might ask.

I know because they are in water designated by the Montana Department of Fish, Wildlife and Parks as "catch and release." ■